

FREDERICKSBURG PATHWAYS

A Bicycle and Pedestrian Master Plan

City of Fredericksburg, Virginia

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and
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INTRODUCTION

Bicycling and walking are fundamental means of travel and an efficient transportation network will provide for them. Integrated bicycle and pedestrian accommodations ensure safe and convenient access to the community, connectivity with the overall transportation network, and independent mobility regardless of age, physical constraints, or income.

When people define the qualities that make Fredericksburg an attractive place to live and do business, they often resort to phrases like quality of life, small town atmosphere, and sense of place. These concepts are pleasant, but how are they really achieved? Part of the answer is found in a community's physical attributes. The historic sections of Fredericksburg include an interconnected street grid, sidewalks, mixed land uses, and safe street crossings. All of these factors provide enormous opportunities for social encounter and exchange in public places, as citizens attend to their daily activities.

Opportunities for unplanned social interaction became diminished, however, when public spaces are given over entirely to automobiles. The full impact of this trend is evident where roads have been built exclusively for vehicles. The Jefferson Davis Highway, the Blue and Gray Parkway, and State Route 3 were designed to move vehicles only. No provision was made for foot traffic even when these corridors subsequently experienced both commercial and residential development. Rather than providing pedestrian connections, road engineers want people on foot removed from their systems. Their Highway Capacity Manual even describes pedestrians as "flow interruptions." Traffic engineers, after all, use speed as a factor to show congestion relief on their computer models.

The deliberate design for speed reaches beyond primary travel corridors into once quiet neighborhoods. Roads that connect major arterials can become heavily used thoroughways in their own right. Twin Lakes Drive, Stafford Avenue, and Prince Edward Street are examples of neighborhood streets that now serve as preferred automobile routes. There are numerous others.

Streets overwhelmed by vehicles become dangerous to everything else. In the United States, pedestrians account for 14 percent of all motor vehicle related deaths (approximately 6,000 per year between 1986 and 1995). For every pedestrian killed, 20 others are injured. Senior citizens comprise 13 percent of the population, but account for 23 percent of pedestrian fatalities. An astonishing 55 percent of pedestrian deaths take place on neighborhood streets. If Fredericksburg is going to regain, or recapture, its quality of life, its small town atmosphere, and its sense of place, it needs to reconnect to itself with safe routes for walking and bicycling.

PURPOSE AND SCOPE

This plan provides the policy frame work through which the City of Fredericksburg will accommodate bicyclists and pedestrians in an integrated transportation system. The intent is to improve the environment in which bicyclists and pedestrians travel, to achieve a safe, effective, and balanced multimodal transportation system. Examples of accommodations include the provision of sidewalks, bicycle lanes and signs, as well as the installation of traffic calming devices that enhance neighborhood safety.

BACKGROUND

The City of Fredericksburg has formally supported trails development since adopting its 1981 Comprehensive Plan. This step came after years of work and advocacy by a group of citizens dedicated to establishing a wide-ranging trails network. The Canal Park Trail was subsequently established in 1983, but further efforts languished as available staff time was directed to working out an annexation agreement with Spotsylvania County.

In 1989, with annexation completed and a revised Comprehensive Plan in place, the Fredericksburg City Council again endorsed the concept of a city-wide pathway system. The Department of Parks and Recreation was authorized to expand upon the Canal Park Trail and begin researching, planning, designing and developing a multi-purpose trail network. The Civil War Sites Trail Plan (1991) gave further impetus to this effort, by highlighting some of Fredericksburg's historic resources that could be protected and included as cultural attractions within a larger trail system.

Trails planning also moved beyond a recreational focus, because a trail system can also facilitate safe non-motorized travel within the community. Research shows that automobile travel typically excludes fully 25 percent of the population, which is the percentage that is either too young or too old to drive or who do not own a vehicle. Buses and railways are necessary components of a transportation system, but clearly so are trails and sidewalks.

To address this need (and to assist in obtaining funding) the City Council adopted a comprehensive trails plan, called Fredericksburg Pathways, in 1996. This document conformed to Virginia Department of Transportation guidelines (A Virginia Guide for Bicycle Facility Planning – 1994).

Since 1993, the Fredericksburg City Council has also incorporated its trails plans into relevant Comprehensive Plans. In this manner, the community's vision for a trails network has been included in all of the City's long-range planning documents and additional trails have subsequently been constructed in conjunction with new road development. Cowan Boulevard and Mary Washington and Sam Perry Boulevards, for example, have sidewalks or bicycle trails within their respective rights-of-way.

In January 2005, the Fredericksburg City Council authorized the Recreation Commission's Pathways Committee to review the 1996 plan and recommend revisions.

The City Council and the Pathways Committee both agreed that a comprehensive review was in order. To formalize its vision, City Council highlighted the concept of connectivity in its adopted goals and initiatives (8 February 2005). This specific goal is to ensure that residents and visitors can readily travel between different sections of the City on streets, pathways and sidewalks.

This revised 2005 trails plan ensures that proposed trail development addresses changing physical conditions yet continues to reflect the overall vision of a cohesive trails system throughout Fredericksburg.

BENEFITS OF PEDESTRIAN AND BICYCLE FACILITIES

A variety of benefits accrue from pedestrian and bicycle facilities – some of them quite apparent, but others more difficult to quantify. Available facilities and the number of people who use them, for instance, can be measured or estimated with reasonable accuracy. The corresponding positive impact on traffic congestion and parking demand can be assumed, but may not be readily determined within the context of a computerized regional traffic model. Computerized traffic modeling aside, pedestrian/bicycle facilities are good for the overall health and fitness of the users, are good for the environment, and will enhance the overall transportation network, especially for persons who do not, or cannot, drive a motor vehicle.

Health and Physical Fitness Benefits

Contemporary lifestyles are not as physically active as they have been in the past and the Center for Disease Control and Prevention emphasizes the connection between health problems and physical activity. As a consequence, many individuals seek to deliberately overcome this deficiency through recreational activity. Walking or cycling are very individualized activities and a person may pursue them as vigorously as he or she desires. Even moderate levels of walking or cycling provide excellent health benefits. As noted before, the number of users can be measured, but the overall improved health of the community, which can be assumed to translate into reduced health care costs, is not so readily shown.

A related aspect of any health benefit is an assumption of user safety. Pedestrian and bicycle facilities need to be designed to minimize conflicts and reduce potential hazards. In addition to addressing safety through facility design, though, research shows that more users will improve overall safety. As bicycle trail use increases, the incidence of accidents actually decreases, as motorists and cyclists learn to accommodate one another. More users reinforce safety as they become more fully accepted as a component of the overall transportation system.

Environmental Benefits

The Fredericksburg region must conform to air quality standards specified in the Clean Air Act when it plans its regional transportation network. This requirement has become

more imperative since June 2004, when the Environmental Protection Agency (EPA) designated this region as a moderate 8-hour ozone nonattainment area. By not attaining the mandated air quality standards, transportation projects must be submitted for an analysis of their anticipated vehicle emissions. In this context, modes of travel that do not result in any vehicle emissions are a welcome development.

While urban dwellers continue to walk extensively, suburban dwellers lack similar opportunities and routinely drive to their various destinations. Newer developments in Fredericksburg are distinctly suburban in nature, requiring an automobile for even brief errands. A well-planned pedestrian/bicycle network has the potential to replace some of the short local trips that must currently be made in an automobile. Short trips are the least fuel efficient, so a non-polluting travel option should be very welcome in a region that must strive to meet EPA air quality standards.

Transportation Benefits

Lewis Mumford, the great urban philosopher, wrote: “A good transportation system minimizes unnecessary transportation; and in any event, it offers change of speed and mode to fit a diversity of human purposes.” Pedestrian and bicycle facilities can reduce automobile trips (thus minimizing unnecessary transportation), provide links to other modes (such as mass transit), and make the overall community more accessible to its citizens (many of whom do not drive automobiles). A trails network can also reduce congestion, as long as modal conflicts are minimized and applicable connections are made. Improvements to accommodate bicycles can also benefit motorists. Wider shoulders to provide bicycle lanes, for instance, have been shown to reduce sideswipes, head on collisions, and road run-offs.

Adapting a transportation network to include pedestrian and bicycle facilities enhances overall safety. A useable network, however, requires that all applicable connections be made as safe as possible. Motorized vehicle speeds, for instance, will need to be reduced on certain roads to encourage non-motorized travel. A series of traffic calming options can provide the necessary means to reduce vehicle speeds on specific routes, in order to reclaim neighborhoods for their residents.

Pedestrian and bicycle facilities need not be limited to the road network. Off road trails can provide numerous benefits. Separation from motor vehicle traffic, for instance, enhances user safety. Well laid out trails also expand travel options. In the right location, off road trails can provide a recreational amenity for both residents and visitors. Such facilities can also function as linear parks with both natural areas as well as historic sites.

Quality of Life/Economic Benefits

A locality's quality of life is defined by such things as sidewalks that connect other parts of the community, safe street crossings, as well as places like coffee shops and restaurants near residential neighborhoods. If points of interest are added – such as

historic sites, a vibrant downtown with multiple activities, and the Rappahannock River – then the local quality of life becomes attractive to visitors as well.

Bicycle and trail facilities have proven to be a wise investment for communities that have created them. These facilities have been demonstrated to have a direct impact on a community's ability to attract jobs and promote tourism, on real estate values, and on the success of nearby small businesses. A recent US Government study of the economic impact of the Washington and Old Dominion Trail found that the trail generated a direct annual benefit of \$7 million into the local economy and resulted in a net total economic benefit of between \$14.1 and 21.6 million.

As an urban area, Fredericksburg is already a relatively compact community. Many destinations are within walking or biking distance and the City's most expensive homes are within the urban core, reflecting an attractive and vibrant center. Some of the outlying areas, however, are isolated, cut off from the community by busy roads as well as distance. In addition, neighborhoods that are not considered part of the visitor circuit have not had their street tree canopy maintained or their streets and sidewalks kept in good repair.

A comprehensive trails network will provide connections to all neighborhoods, even the ones that are currently somewhat neglected. In addition, trails will provide links to historic attractions and sites, which will make them attractive to visitors. A sustained attention to planting trees along trails and streets will also enhance the local quality of life while encouraging visitation.

PLANNING PROCESS OVERVIEW

In January 2005, the Fredericksburg City Council authorized the Recreation Commission's Pathways Committee to review the 1996 Fredericksburg Pathways Plan.

This committee had already begun to meet in October 2004, to examine existing plans from several other localities and to develop materials for public presentations. From January through April, the group briefed many local organizations. During that period, the committee also worked with the City Manager and City Council, to ensure trails funding would be included in the City's Capital Improvement Program.

In May 2005, several committee members traveled to Richmond for the Governor's Conference on Greenways, Blueways, and Trails. In addition, staff met with David Brickley to discuss the City's ongoing trails planning and to coordinate local efforts with the East Coast Greenway, an urban version of the Appalachian Trail that will extend from Maine to Florida and is planned to be routed through Fredericksburg.

Plan development continued through the summer months and a draft Pathways Plan was presented to the public on October 10, 2005. The Recreation Commission received the completed Plan on October 20, and subsequently directed the Pathways Committee to submit the draft plan to the Planning Commission. The Planning Commission

recommended approval of the submitted plan on November 30, 2005. City Council adopted the final draft on December 13, 2005, and directed staff to incorporate the completed plan into the City's 2006 Comprehensive Plan.

CITIZEN PARTICIPATION

In January 2005, the Fredericksburg Pathways Committee initiated a concerted public participation process. Members of the Committee provided a series of presentations to the City's elected officials, the Recreation Commission, various user groups such as cyclist and hiking clubs, resource advocacy groups such as the Friends of the Rappahannock, health organizations such as the Health Care Assembly, the AARP, and every neighborhood group that meets on a regular basis.

In addition, the Committee held a public forum at the Central Rappahannock Regional Library on May 31, 2005. Approximately 70 citizens attended this well advertised event. Participants provided ideas about potential trail routes as well as expressed their thoughts on overall trails policies. The Committee compiled the received comments and began to evaluate each idea and suggestion, to determine what could be incorporated into a revised trails plan.

The Committee developed a draft plan, which was then presented at another public forum on October 10, 2005. Approximately 37 citizens attended this meeting and provided comments and suggestions, which the Committee incorporated into the plan before submitting the next draft to Recreation Commission, on October 20, for further submittal to the Planning Commission. The Committee also conducted tours of selected routes on the 15th, 16th, and 22nd of October.

There were two public hearings associated with the proposed trails plan. The Planning Commission held its public hearing on November 9, 2005, which also opened a 15-day public comment period. This comment period closed on November 23, 2005 and the Committee incorporated all received comments before submitting the final draft to City Council. The City Council held its public hearing on December 13, 2005, and adopted the revised trails plan (Fredericksburg Pathways), by Resolution 06__.

COMPREHENSIVE PEDESTRIAN/BICYCLE PLANNING

Cities do not function well with only one mode of transportation. Vibrant urban communities invariably have transportation systems that accommodate a diversity of human purposes. To achieve this end, planning must include a variety of modes, to ensure a community becomes functional to all of its citizens. Due emphasis must be placed on the entire population, not just those persons who drive automobiles. There is no single step, however, that will provide an attractive, well-functioning community. Instead, a variety of individual steps must be taken during the ongoing and overall development/redevelopment process, to achieve a result that meets basic community needs. An emphasis must be placed on addressing pedestrian and cyclist needs on a daily basis, in order to achieve an accessible community within a reasonable number of years.

PRINCIPLES OF PEDESTRIAN/BICYCLE PLANNING

There are several factors that make a community accessible to pedestrians and cyclists. They are a combination of urban design considerations, transportation planning elements, as well as land use provisions. No single accomplishment ensures success, but the following principles of pedestrian/bicycle planning provide a comprehensive approach that acknowledges travel of all kinds.

Design a Pedestrian-Friendly Environment

A pedestrian-friendly environment includes continuous sidewalks and safe, multi-modal connections to local destinations. These facilities should also be comfortable to use. Pedestrians should be protected from moving traffic by on-street parking as well as a barrier of street trees. A tree canopy will also provide welcome shade. Transit stops should also be safe and readily accessible. The degree to which the following features can be incorporated will determine how pedestrian-friendly Fredericksburg will become.

- Locate bus stops adjacent to commercial areas rather than at the far edge of parking lots.
- Ensure streets have pedestrian crossings at bus stops.
- Provide crosswalks at all signalized arterial intersections. Construct overpasses only as needed.
- Provide sidewalks that are appropriately sized to allow an adequate utility strip for tree planting.
- Ensure sidewalks remain unobstructed.
- Provide shade trees on all streets with sidewalks
- Ensure all applicable provisions are made for persons with disabilities.

Ensure Pedestrian/Bicycle Connections

Commuting to work represents approximately 20 percent of all household trips. The other 80 percent of trips include travel to daycare, school, shopping, errands, and

recreation. Where local destinations can be reached by walking or cycling, residents have a choice as to whether they will drive or not. The following steps can increase the available transportation choices for residents.

- Provide a coordinated system of bicycle/foot trails throughout the community.
- Locate pedestrian routes and bicycle trails along streets, as much as possible, rather than through parking lots or in the rear of residential areas.
- Link pedestrian routes and bicycle trails to local destinations and building entrances. Where street connections are not feasible, provide connections, as necessary, between residential and commercial areas.
- Connect pedestrian routes and bicycle trails to bus stops.
- Provide bicycle racks at attractions and destinations.
- Ensure bicycle/foot trails are easily followed, through unified pavement textures, street trees, and street furniture.

Provide Interconnected and Safe Streets

Interconnected streets are inherently well-suited for walking and cycling. They provide convenient and direct routes in marked contrast to the circuitous road networks found in contemporary residential subdivisions. Interconnected streets also provide multiple routes to local destinations. Consequently, no single street gets overloaded with traffic and vehicles move at slower speeds through intersections, which is more conducive to pedestrian safety. A cohesive street grid provides an interconnected community, while individual street design impacts driver as well as pedestrian safety.

- Ensure a hierarchy of streets that provide connections to local destinations while protecting neighborhoods from excessive congestion.
- Avoid developing dead end streets that curtail pedestrian circulation and preclude bus service in a neighborhood.
- Design neighborhood streets that discourage excessive automobile speeds that threaten pedestrian safety.
- Implement traffic calming improvements where connector streets pass through neighborhoods.
- Encourage on-street parking to buffer pedestrians/cyclists from moving traffic.
- Design intersections with minimum widths, to slow traffic as well as reduce pedestrian crossing distances.
- Design local streets to enhance pedestrian safety, through minimum widths, turning radii, and design speeds.

Develop/Redevelop with Appropriate Densities and Mixed Uses

Concentrated activities within a well planned street pattern provide a pedestrian-oriented place with strong economic potential. Such development should not displace vehicular traffic, but simply integrate it into the built environment. The defining element of any built environment is its infrastructure. The following planning concepts relate to

accommodations for automobiles, but will affect the feasibility of walking and cycling in Fredericksburg.

- Implement reduced parking standards, where warranted by walkable environments and mixed uses.
- Design parking lots so they do not dominate street frontages, interrupt pedestrian routes, or negatively impact surrounding neighborhoods.
- Break extensive surface parking into smaller lots by placing a street through two parking areas or locating a building between parking areas.
- Minimize building setbacks.
- Integrate parking structures into existing streetscapes.
- Provide for increased densities during redevelopment of existing commercial areas by reducing areas of surface parking with structured parking facilities.
- Integrate existing uses into comprehensive pedestrian-oriented plans that are developed during redevelopment efforts.

Ensuring that Fredericksburg remains a walkable community will entail two approaches. First, pedestrian infrastructure needs to be considered and accommodated during any capital project, such as new roadways or existing roadway improvements. Second, existing places that have been allowed to become overwhelmed by motorized transportation need to be retrofitted, as feasible, to improve the pedestrian environment. This latter task will appear overwhelming, but can be successfully accomplished street by street, and neighborhood by neighborhood.

IDENTIFICATION OF USERS

There are a great many categories of pedestrians. There are hikers and power walkers, children with or without their parents, and a growing elderly population. There are cyclists of varying levels of ability. Further, there are persons with impaired vision and/or hearing as well as those with physical or mental disabilities. All of these users need to be considered when designing pedestrian facilities.

Pedestrians

Pedestrians will generally be the largest group of trail users. They often walk or jog in pairs, so multi-use paths should allow for two pairs of people to pass one another. Hikers are capable of more challenging terrain and prefer trail locations that are more isolated. In terms of age, children generally require supervision and have not yet developed adequate perceptions of speed and distance; teenagers exhibit poor judgment and a sense of invulnerability; adults are generally fully aware, but with a diminishing of reflexes as they grow older; and older people may suffer from a loss of sight or hearing, move slowly, and not react quickly.

The Americans with Disabilities Act (ADA) requires that all new design, construction and renovation projects will be readily accessible to users with disabilities, except where an entity can demonstrate that it is structurally impractical, excessively difficult or

expensive to meet the requirements of design. Not all trails (particularly hiking trails) can be made fully accessible, but shared use trails should be ADA compliant.

Bicyclists

There are two primary goals in developing bicycle trails. The first is to accommodate current bicycle users. The second is to encourage an increase in their level of use. Both goals rely on enhanced safety, but experienced bicyclists will have very different needs than novice riders. As a consequence, trails development must address the needs of various skill levels. To assist in this process, bicyclists have been classified as follows:

Group A – Advanced Bicyclists - Advanced cyclists are highly skilled, with experience in operating a bicycle under most traffic conditions. They are best served by improvements to the existing street system, because they seek direct access to destinations with the opportunity to operate at maximum speeds and with minimum delays. This group seeks sufficient operating space on the roadway or shoulder, to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.

Group B – Basic Bicyclists - Basic cyclists are casual or new adult and teenage riders who are not as confident as advanced cyclists in their ability to operate in traffic. Some will develop the advanced skills of advanced cyclists, but there will always be large numbers of basic bicyclists. They seek comfortable access to their destinations, as directly as possible, but using either streets with low traffic volumes or separate bicycle paths. Where the bicycle route must share the right of way of arterial streets with higher traffic volumes, this group prefers a well defined separation between bicycles and motor vehicles.

Group C – Children - Children are defined as pre-teen riders whose cycling is initially monitored by parents, but who will eventually need independent access to the trail system. This group seeks access to destinations around their neighborhoods, including schools, recreational facilities, shopping opportunities, and other neighborhoods. Like basic cyclists, children prefer low volume/low speed streets, separate paths, and well defined separations between bicycles and motor vehicles.

Standard bicycle trails planning combine's user groups into two broad classes of cyclists – Group A riders and Group B/C riders.

Group A riders are best served by making most (if not all) streets bicycle friendly. This goal is accomplished by wide curb lanes (in urban areas) and paved shoulders (where curbs and gutters are not used) to allow cyclists to share roadways with motor vehicles.

Group B/C riders are best served by providing designated bicycle facilities on key travel corridors. Such corridors should include neighborhood streets (with appropriate traffic calming features) and designated facilities that are carefully separated from vehicular traffic.

This two-tiered approach, if fully implemented, will provide for every street where bicycles are permitted to have at least the design treatments recommended for Group A bicyclists. In addition, a network of selected routes will be enhanced by incorporating the type of designated bicycle facilities that are recommended for Group B/C bicyclists.

FACILITY DESIGN

The nature of the built environment determines how readily accessible it will be to pedestrians and bicyclists. Specific factors include the proximity of destinations to one another, sufficient densities and mixed uses to support transit as well as local commercial activity, and convenient links to other modes of transportation such as trains and buses. Pedestrians and cyclists, however, need more than sidewalks, bike routes, and crosswalks. If these facilities are going to be used, they must also provide an acceptable level of security, comfort, and interest.

Pedestrian Facility Design

Walkways provide a travel route in the public right-of-way for people traveling on foot. This basic amenity in urban areas needs to include design features that make them safe, secure, and comfortable.

Sidewalks or Walkways – Sidewalks and walkways provide pedestrian access for all types of foot traffic. Their width can vary, depending upon location and volume of foot traffic. The Institution of Transportation Engineers recommends a minimum width of 5 feet, but in historic and developed areas, sidewalk width should be coordinated with the available utility strip so the sidewalk does not preclude the viability of street trees. This buffer zone between pedestrians and vehicular traffic will also vary, depending upon location. In downtown areas and commercial districts, an area for tree wells and street furniture (benches and street lights) is usually sufficient. In residential areas, a green strip with street trees is more suitable. Both areas can be enhanced with the additional separation between pedestrians and vehicular traffic provided by on-street parking.

Crosswalks – Marked crosswalks indicate the preferred location for pedestrians to cross a street; provide curb ramps for wheelchairs, strollers, handcarts, and bicycles; and help to designate where motorists will yield to pedestrians (consistent with any signs or signals). Crosswalk locations should be convenient for pedestrians. Crosswalk markings, however, are not sufficient, in and of themselves, to address pedestrian safety. Appropriate signs and, curb extensions should also be used to reduce the potential for pedestrian/vehicle conflicts.

Transit Stops – Most pedestrians will not be able to access all of their desired destinations on foot. Conveniently located transit stops (for both bus and rail service) are necessary to provide additional modal links. Bus stops should be in highly visible locations where pedestrians can reach them by accessible travel routes. A complete sidewalk system is clearly essential to support a public transportation system. In addition

to being convenient, bus stops also need to be properly located for user safety and be comfortable places to wait (preferably under cover). Adequate space must also be kept clear at transit stops to operate wheelchair lifts.

Overpasses/Underpasses – Overpasses and underpasses provide complete separation of pedestrians from vehicular traffic, but should be used only where no other pedestrian facility is possible. Overpasses/underpasses typically include elevators and/or extensive ramping (and so are prohibitively expensive) yet will not typically be used if a more direct route is available. Grade separation is most feasible where off-road bicycle/foot trails must cross highways, high speed/high volume arterial roadways, or railroad tracks.

The Walkway Environment – Sidewalks should be continuous and provide access to goods, services, transit, and homes. Well designed walking environments should also include benches, bus shelters, and trash receptacles. Pedestrianways should be kept clear of poles, signposts, news racks or anything else that blocks the path, obscures a driver's line of sight, or constitutes a tripping hazard. Benches, bicycle racks, and other street furniture should be placed to create an unobstructed path. Snow removal ordinances should be enforced. Overhead clearances for signs and awnings should be maintained.

Roadway/Intersection Design

Pedestrians are affected tremendously by traffic volumes and vehicle speeds. Statistically, a person is more likely to be injured or killed in an automobile accident – either as a pedestrian, a passenger, or a driver – than they are likely to be injured or perish in a fire. Standards for safety along residential streets, however, are far lower than for fire safety within dwellings. If a community desires to establish and maintain a pedestrian/bicycle facilities network, it needs to take the lead to address user safety in roadway design as well.

Streets already serve multiple functions. They provide the surface and structure for selected modes of transportation. They provide public access to destinations. They provide right-of-way for utilities, both above and below ground. Streets also help to define a community's sense of place. They provide a setting for activities and celebrations (Soap Box Derby, First Night, July 4th, block parties and the Christmas Parade). Safe, tree-lined streets are also places where neighbors simply stop to chat. The importance of streets to the social fabric of the locality needs to be respected.

Bicycle Lanes – Bicycle lanes provide a dedicated route for cycling along busy streets. They are typically designated by striping and signing. Bicycle lanes result in slightly narrower vehicle lanes, which serve to lower motor vehicle speeds. Not every road is conducive to such modification, though. On high speed, high volume roads, it may be more appropriate to provide a multi-use path for bicyclists and pedestrians that is physically separated from the roadway traffic. All roads should be evaluated for on-street bicycle facilities, but such features should only be implemented where adequate space can be provided between the bicycle lane and parked cars so that open doors do not create a hazard to users.

Roadway Narrowing – Space within an existing right-of-way can sometimes be redistributed to other users. As noted above, lane widths can be reduced and the excess asphalt striped with a bicycle lane. The street itself, however, can also be physically narrowed, to install or extend sidewalks and landscaped areas. These types of improvements will reduce vehicle speeds, which, in turn, enhances pedestrian movement and safety. Road narrowing must be addressed carefully, however, to ensure continued access by school buses, emergency vehicles, and trucks. In addition, care must be taken to ensure that narrowing a street does not divert traffic to other neighborhood streets.

Raised Medians – Medians are raised barriers in the center of the street or road. They can provide left hand turning pockets, a safe place for pedestrians crossing the street, as well as space for street trees and landscaping. Raised medians are most useful on high speed, high volume roads, but intermittent sections can be constructed where reduced traffic speeds are desired to avoid friction with bicycles and pedestrians.

One –Way Streets – Two sets of one-way streets accommodate traffic traveling through Fredericksburg’s Central Business District (CBD). The William Street/Amelia Street corridor serves east-west traffic while the Princess Anne Street/Caroline Street corridor handles north-south traffic. Returning these one-way streets to two-way traffic would allow better local access to some businesses and would also slow traffic. The CBD, however, does not have adequate alleyways or loading zones to support local pick-ups and deliveries. Streets in the CBD must provide for through traffic, on-street parking, and delivery truck loading and unloading. Both lanes of these one-way corridors are needed so motor carriers can stand in the right-of-way in order to serve downtown businesses. There are additional local streets that are one-way routes because they are only wide enough to allow a row of on-street parking and a single travel lane.

Curb Radius Reduction – A wide curb radius allows a motorist to make a high-speed turn, but jeopardizes pedestrians. Reducing the radius to provide a tighter turn will reduce turning speeds, shorten the crossing distance for pedestrians, and improve the visibility between pedestrians and motorists. When reconfiguring a street, however, the actual user needs to be considered. If the radius is too tight for the type of vehicles that use the road, large trucks and buses may end up riding over the curb, endangering pedestrians rather than remaining safely out of their way.

Roundabouts – A roundabout is a circular island at an intersection that may take the place of a traffic signal. Traffic maneuvers around the circle in a counterclockwise direction and turns right onto the desired street. Left turn movements are eliminated. Roundabouts are an excellent traffic management feature because they avoid the backups at a traditional traffic signal. They reduce traffic speeds and create a gateway into an area, but they can be difficult for bicyclists and pedestrians. Bicycle paths and pedestrian routes will need to avoid roundabouts in order to maintain acceptable levels of safety.

Intersection Median Barriers – A raised curb median extending through an intersection will prevent cross-street through-movements and left turns into cross-streets from the

main street. Cut-throughs can be provided to allow pedestrians and cyclists to access neighborhoods, but this measure should not be implemented until traffic analysis has been done to ensure there will be no adverse impacts on nearby streets.

Traffic Calming Techniques

Traffic calming devices are street design features that encourage people to drive more slowly or to take another route. They are self enforcing features that effectively reduce cut-through traffic and speeding in neighborhoods because the physical design of the street results in the desired effect. Some residential streets in Fredericksburg are long, wide, and smooth – features that encourage speed. In response to the neighborhood setting, these efficient roads are posted for slow speeds. When the posted speed does not relate to the design speed, however, people usually react to the design speed (both deliberately as well as inadvertently) and exceed the posted limit. Traffic calming results in a street that is less efficient, in order to restore the neighborhood quality of a residential area. These modifications are made in the existing right-of-way, can be landscaped to enhance the neighborhood, and will keep a road open.

There are a series of principles applicable to implementing traffic calming measures, as follows:

- Vehicle speed is more critical than traffic volume, in terms of safety, and should be addressed first.
- Traffic calming devices should incorporate neighborhood input.
- Traffic calming should fit into, and enhance, the existing street.
- Traffic calming devices should be predictable and easy to understand.
- Devices that meet multiple goals will be more acceptable. A raised crosswalk, for instance, has a clear goal understandable to motorists. A speed bump, on the other hand, will be perceived as a nuisance.
- Devices must accommodate emergency vehicles.
- Treatments need to be appropriately spaced (300 to 500 feet apart) to have the desired effect.
- Devices should not be under-designed or they will fail to be effective.
- Traffic calming measures should accommodate bicyclists and improve pedestrian conditions.
- Traffic calming is meant to encourage the use of faster arterial routes. If a measure is likely to divert traffic to another local street, a wider application should be considered so a problem is not shifted from one part of a neighborhood to another.

Traffic calming measures effectively change a driver's perception of the street, to reduce the vehicle speed. Reduced speeds in neighborhoods increase pedestrian safety. There are a variety of measures that are used for calming vehicular traffic, but they all derive from a few basic principles. These range from narrowing the street, deflecting the vehicle path, incorporating raised devices, and adding complementary effects through

gateways and landscaping. The following individual measures usually meet several of these categories and are also typically used in combination with one another.

Narrowing the Street through Curb Extensions – Curb extensions extend the sidewalk or curb line into the parking lane, effectively reducing the street width. This option enhances pedestrian safety by reducing crossing distances, reducing the speed of turning vehicles, improving the ability of pedestrians and drivers to see one another (by preventing vehicles from parking at corners), and by encouraging pedestrians to cross at designated locations. The following considerations should be addressed when planning curb extensions:

- Curb extensions should only be used where there is a parking lane and where cyclists would be traveling outside the curb edge.
- Mid-block extensions can enhance mid-block crossings, but any street furniture or landscaping must not block a driver's view of pedestrians.
- Curb extensions should be designed to accommodate trucks or buses, if those types of vehicles use the intersection in significant numbers.
- Keeping intersections clear of parked cars, through curb extensions, can enhance emergency access. Fire trucks and other emergency vehicles can climb a curb, if necessary, more readily than they can move a parked car out of the way. Curb extensions at intersections or mid-block can keep fire hydrants clear of parked vehicles and therefore more accessible.
- Curb extensions can create additional space for curb ramps, landscaping and street furniture.

Narrowing the Street through Chokers – Chokers are curb extensions that narrow a street by widening the sidewalks or planting strips. They can be created by bringing both curbs in toward the middle of the street or dramatically widening just one side of a street. These devices are usually only appropriate on low-volume, low-speed streets.

Narrowing the Street through Crossing Islands – Raised islands in the center of a street allow pedestrians to deal with only one direction of traffic at a time. The island allows them to stop partway across a busy street before crossing the second half. These facilities are especially effective at unsignalized crossing points, but will need to be lit and signed to be visible to motorists.

Deflecting the Vehicle Path through Mini-Circles - Mini-circles are raised islands constructed in the center of intersections where traffic volumes do not warrant a stop sign or a signal. They significantly reduce speeds, but should be implemented with careful attention to the following details:

- Turning radii should be kept tight, to ensure vehicle speeds are reduced, which will enhance pedestrian and bicycle safety.
- Larger vehicles that need access to the streets (school buses, fire trucks, etc.) need to be allowed to make left-hand turns in front of the circle.
- Yield signs should be used as controls rather than stop signs.

- Mini-circle landscaping should not compromise lines of sight.

Raised Devices - Speed Humps – Speed humps are paved features, 3 to 4 inches high, that extend across a street, but with a tapered edge near the drain gutter to accommodate bicycles (and drainage). Speed humps have a very predictable speed reduction impact, ranging from 12 foot-wide humps that have a design speed of 15 to 20 miles per hour to 22 foot-wide humps that have a design speed of 25 to 30 miles per hour. Speed humps should not be confused with the annoying speed bumps used in some commercial parking lots. The following limitations should be considered when planning the use of speed humps.

- Speed humps should not be installed on sharp curves or on steep grades.
- Installation of speed humps should be coordinated with bus operators and fire departments.
- Traffic noise may increase, especially if trucks use the impacted route.
- Drainage must be carefully managed.

Raised Devices - Entire Intersections or Pedestrian Crossings – To take the concept of a speed hump one step further, some localities use raised platforms, whether entire intersections or just a raised mid-block crosswalk. Raised intersections and mid-block crosswalks reduce vehicle speeds as well as enable pedestrians to cross the street at the same level as the sidewalk, which eliminates the need for curb ramps. Raised intersections and crosswalks also encourage drivers to yield. The same principles that guide speed humps should also guide raised intersections and crosswalks.

Complementary Effects - Gateways – A gateway is a physical or geometric landmark that indicates a transition from a higher speed road to a quieter one. They can be a combination of street narrowing, median, roundabout, or other traffic calming feature. Gateways should clearly signal to drivers that they have reached a specific place where reduced speeds are necessary. They are only an introduction to slower speeds, though, and will need to be supplemented by additional traffic calming measures within the slow traffic area.

Complementary Effects - Landscaping – Trees along a street provide a pleasant pedestrian and neighborhood environment. Trees, however, also separate vehicular traffic from pedestrians as well as visually narrow the street (which helps to reduce vehicle speeds).

EXISTING CONDITIONS

Fredericksburg has taken a series of steps to develop multimodal transportation facilities within a pedestrian friendly environment. Individual initiatives have included retrofitting the downtown rail platform for commuter rail use, bringing the entire rail complex up to ADA standards (for both VRE and AMTRAK), incorporating bicycle carriers on FREDericksburg Regional Transit buses, ensuring bus routes serve all City neighborhoods, retrofitting all sidewalks with curb ramps, and constructing pedestrian/bicycle trails along designated rights-of-way.

TRAILS IN PLACE

The City of Fredericksburg installed the Canal Path Trail in 1983, linking neighborhoods, medical facilities, commercial areas, and recreational areas along a scenic and historic waterway. This initial project highlighted the potential of these types of amenities and remains well used. The City did not immediately construct additional trails, but the idea of a comprehensive trail network carried over into successive Comprehensive Plans and was revisited in an updated trails plan in 1996. As a result of the 1996 plan, pedestrian and bicycle facilities were incorporated into the Cowan Boulevard construction project. Furthermore, Mary Washington Hospital followed the City's lead and included similar facilities in their extension of Mary Washington and Sam Perry Boulevards. These new facilities made a significant contribution to the overall pathway system and renewed interest in developing still more facilities. These individual projects are described further, below:

Canal Path Trail

Type: Separate shared use trail
Location: Fall Hill Avenue to Princess Anne Street, along the Rappahannock Canal
Length: 1.75 miles
Description: This separate shared use path follows the route of an historic canal through several residential neighborhoods. It crosses the Jefferson Davis Highway through an underpass, but is cut by Washington Avenue and Fall Hill Avenue (where they connect to Prince Edward Street). There are two foot bridges across the canal to connect the Canal Trail to Normandy Avenue and Dale Street.
Needed Connections: A crosswalk is needed where this trail intersects Princess Anne Street. A safe crossing is also needed at the Fall Hill Avenue end of this trail and is currently proposed to be accomplished with a culvert, to be installed when the Fall Hill Avenue bridge is replaced.

Cowan Boulevard Trail

Type: Separate shared use trail
Location: Powhatan Street to Carl D. Silver Parkway
Length: 1.7 miles

Description: The Cowan Boulevard improvements included installation of a shared use trail on one side of the roadway and a sidewalk on the other, for most of its length. These facilities safely cross Interstate-95 on a new bridge, providing a critical east-west link.

Needed Connections: The existing trail ends at the intersection with Powhatan Street/Keeneland Road. A connection across the Jefferson Davis Highway is still needed and is referenced in the chapter called Proposed Trail System.

Mary Washington Boulevard and Sam Perry Boulevard Trails

Type: Shared use trail

Location: Cowan Boulevard to Canal Path Trail

Length: .75 miles

Description: The extension of Mary Washington Boulevard and Sam Perry Boulevard to Cowan Boulevard included installation of a shared use trail on one roadway and a sidewalk on the other, to tie in with the same type of facilities on Cowan Boulevard. Plans call for these facilities to tie in with the Canal Path Trail and Jefferson Davis Highway on their lower end.

Needed Connections: The link to the Canal Path Trail is not yet constructed.

Nature/Historic Sites Trails

Alum Springs Trails

Type: Natural walking trail

Location: Alum Springs Park

Length: 1 mile

Description: Dirt walking paths extend along Hazel Run and elsewhere throughout the park. They are not named or marked with signs, but include simple interpretive signs and a number of ruins and natural points of interest.

Mott's Run Trails

Type: Natural walking trails

Location: Mott's Run Reservoir

Length: 5 miles

Description: Natural dirt trails extend along the shore of the reservoir. They are marked with painted blazes on trees and are individually named and color coded. The Parks and Recreation Department provides a published guide to the trails and associated activities such as an orienteering course and a nature center.

Smith Run Trail

Type: Natural walking trail

Location: Smith Run valley

Length: .7 miles

Description: Natural trail that extends from Hugh Mercer School to the Smith Run battlefield site. A substantial wood bridge crosses Smith Run.

Needed Connections: A short extension of this trail will be constructed into a Civil War battlefield preservation area once that site is deeded to the City of Fredericksburg.

Mary Washington Hospital Trail

Type: Natural walking trail

Location: Wooded area between Mary Washington Hospital and the apartments and retail centers along the Jefferson Davis Highway.

Length: .5 miles

Description: Narrow foot path, built by Snowden House and local Boy Scouts. Currently in disrepair.

Needed Connections: A short extension of this trail will be constructed into a Civil War battlefield preservation area once that site is deeded to the City of Fredericksburg.

Battlefield Trails

Type: Natural walking trails

Location: Fredericksburg and Spotsylvania National Military Park

Length: Various

Description: Natural dirt trails that follow trench lines and terrain features. Extend into Spotsylvania County, within the National Park.

Recreational Tracks

Dixon Park Circuit

Type: Surfaced recreational trail

Location: Dixon Park

Length: 1 mile

Description: Asphalt surfaced trail around the circumference of Dixon Park, connecting to various fields as well as providing a path for recreational walking and running.

University of Mary Washington Fitness Trail

Type: Surfaced track

Location: University of Mary Washington Athletic Fields

Length: .75 miles

Description: Dirt, shell, and stone dust surfaced trail around the University's athletic facilities.

Map 1. Trails in Place

UNMET NEEDS

Fredericksburg's downtown area remains conducive to foot travel, but current road planning and development typically considers the motorist as the primary, if not sole, user of the transportation system. The existing system of sidewalks allows movement within the downtown area, but are not adequately tied into the existing system. They also do not connect the downtown area with outlying residential areas. In addition, street crossings and intersections throughout the City are inadequate for pedestrian use. Crosswalks are frequently non-existent and often poorly marked. Street corners do not always allow adequate street visibility for people on foot and many traffic signals are not timed to allow pedestrian crossing. In order to make the City more friendly to pedestrians, trails need to be fully connected to one another and existing facilities need to be made more pedestrian friendly.

Cycling is a basic means of getting around, but identifying specific needs has typically been closely linked to standard road planning. The basic methodology has been to project potential bicycle trips as a percentage of existing or planned motor vehicle patterns. Bicycle traffic, however, may not be suitable on routes that are heavily traveled by motor vehicles, such as Routes 1 and 3. Instead, bicycle safety may dictate independent routes for cyclists, to avoid heavy traffic, complex intersections, and numerous entries into commercial parking lots.

More realistically, bicycle traffic is generated by the proximity and accessibility of trip origination points, such as neighborhoods or visitor facilities, to various destinations. A modal split based on vehicular traffic, fits into the existing road planning formulas, but other available data can be used justify an investment in bicycle facilities. A Harris Poll conducted in the 1990s, for instance, revealed that of 82 million Americans over the age of 18, 46 percent rode bicycles. More than this percentage (53 percent) said they would ride a bicycle if they had safe, separate designated trails on which to ride. In addition, 46 percent said they would commute to work by bicycle if safe bicycle routes were available.

Demand for bicycle facilities and pedestrian features is strongest where neighborhoods are within a reasonable distance of a community's activity centers. In this context, though, it is not enough to simply construct a trail to a destination. The connecting link between a trail and a specific site needs to be coordinated to ensure user safety as well as convenience. A coordinated site development review process needs to be implemented to ensure a cohesive and usable trails network is developed in a timely manner and without need for unnecessary retrofits. If safe and efficient links can be established, they will certainly be used.

ATTRACTIONS AND DESTINATIONS

There are a significant number of locations in Fredericksburg that would attract bicycle/foot traffic, if the appropriate facilities were available for pedestrians and cyclists. Origination points include residential neighborhoods throughout the City as well as

visitor facilities, such as local hotels as well as visitor parking areas, and the rail station. The following destinations are listed under the following general headings:

Schools -	Hugh Mercer School James Monroe High School Lafayette Upper Elementary School Old Walker-Grant School University of Mary Washington Walker-Grant Middle School
Employment and Commercial Centers	Celebrate Virginia Central Park Commercial Corridors (Route 1, Route 3) Downtown Fredericksburg Battlefield Industrial Park Mary Washington Hospital University of Mary Washington
Recreation Facilities -	Alum Springs Park City Dock/Riverwalk Dixon Park Dorothy Hart Community Center Hurkamp Park/Farmer's Market Kenmore Park Maury Field Mott's Run Reservoir Old Mill Park Rappahannock Outdoor & Education Center Snowden Park
Transportation Connections -	Rail Station (VRE, AMTRAK) FREdericksburg Regional Transit (Fred Central)
Regional/Visitor Attractions -	Celebrate Virginia Downtown Visitor Center Fredericksburg-Spotsylvania National Military Park Kenmore/Washington Avenue Rappahannock River

CONSTRAINTS

Developing trails is not as difficult as overcoming the barriers that can prevent them from being linked together. A cohesive, usable trail system will need to cross busy highways that course through town, safely negotiate heavily traveled arterial roads, as well as span numerous streams that routinely overflow their banks. While adequate bridges will serve

to get across waterways of various size, road crossings will require consideration of culverts, bridges, as well as at-grade crossings. Bridges and culverts, for instance, are absolutely required to cross Interstate-95. The Cowan Boulevard bridge accommodates both cyclists and pedestrians and a Fall Hill Avenue bridge will need to provide similar facilities. Connecting the Central Virginia Railway trail to Spotsylvania County, however, can only be accomplished through a culvert under Interstate-95. Routes 1 and 3, can be overcome by appropriate modifications at existing signalized intersections, but other crossings will go under major thoroughways, as has occurred where the Canal Park Trail courses under the Jefferson Davis Highway (Route 1 Bypass). Similarly, a trail along the Rappahannock River, from the existing Canal Park Trail to Celebrate Virginia, will be constructed under Interstate-95. Most other crossings, however, will be able to occur at-grade and will require coordination with existing and anticipated vehicular traffic.

Major Barriers and Intersections

Fredericksburg has always been a crossroads community. Established at the head of navigation on the Rappahannock River, seagoing vessels docked at its wharves to receive goods from the interior. North-south travel crossed the river at the ford near Falmouth. Bridges were built to handle the growing volume of commercial traffic and these were replaced with bigger and better facilities as time, technology, and resources allowed. Today, Fredericksburg is criss-crossed with interstate highways, state routes, bypasses and a railroad. In addition, any trails network must still contend with the Rappahannock River, other streams, and a nineteenth century canal. The following chart lists the various barriers and notes what type of improvements are needed at their various intersections.

INTERSECTION	ACCOMODATION FOR PEDESTRIANS/CYCLISTS
I-95 at Embrey Dam/Rappahannock Canal Trail	Trail can pass under the interstate bridge
I-95 at Fall Hill Avenue	A new bridge is needed with integral hiking/biking features
I-95 at Cowan Boulevard	New bridge in place with sidewalk and trail
I-95 at State Route 3	Not suitable for pedestrians/cyclists
I-95 at the Virginia Central Railway	Any trail into Spotsylvania County will need to pass <u>under</u> the interstate.
Jefferson Davis Highway at Caroline Street/Riverside Drive	Trail can pass under the Falmouth Bridge
Jefferson Davis Highway at Fall Hill Avenue	Improve intersection for pedestrian and bicycle safety
Jefferson Davis Highway at Rappahannock Canal	Trail passes under Jefferson Davis Highway but improved lighting needed
Jefferson Davis Highway at Cowan Boulevard	Improve intersection for pedestrian and bicycle safety
Jefferson Davis Highway at Route 3	Avoid routing pedestrians or cyclists through this area
Jefferson Davis Highway at Virginia Central Railway	Establish at-grade crossing with demand traffic light
Route 3 at Mahone Street	Provide for pedestrian/bicycle safety when new intersection is designed
Blue & Gray Parkway at William Street/Greenbrier Drive	Improve intersection for pedestrian and bicycle safety
Blue & Gray Parkway at Lafayette Boulevard	Improve intersection for pedestrian and bicycle safety
Blue & Gray parkway at Dixon Street	Sidewalks are already in place along Dixon Street and safely pass under the parkway
Rappahannock River at Falmouth Bridge	Improve existing bridge sidewalks to enhance pedestrian and bicycle safety
Rappahannock River at Chatham Bridge	Improve existing bridge sidewalks to enhance pedestrian and bicycle safety
Rappahannock River at Ferry Farm Crossing	Provide accommodations for bicycles if ferry service is reestablished by George Washington's Fredericksburg Foundation
Rappahannock Canal at Fall Hill Avenue	Install culvert when canal bridge is replaced, to allow pedestrians/cyclists to travel <u>under</u> Fall Hill Avenue

GOALS AND OBJECTIVES

COMMUNITY VISION

A comprehensive trail system is a long-term undertaking. Each section must be developed as opportunity presents itself and funds become available. Exceptional care must be taken, however, to ensure that this seemingly disjointed effort results in a well integrated whole. This end result can be readily achieved as long as the layout of the trail network is sound and there has been proper planning for signs, trail specifications, and other unifying features. Each section will thus become a positive contribution to what has been previously developed and generate increased interest and support for the development of subsequent sections.

During the Summer of 2005, the Pathways Committee conducted a survey to ascertain the desires and goals of the community concerning a trail system. Counting families, nearly 500 people were represented by the survey results. These results indicated that the top three desired activities were walking, cycling, and nature appreciation. The preferred destinations were downtown, parks, and shopping areas. The most desired design elements were paved surfaces, natural surroundings, adequate signs, benches, and trash receptacles. The main concerns were security, road crossings and intersections, connections, cleanliness, and visual access to the Rappahannock River.

GOALS AND OBJECTIVES

The following goals and objectives provide a basis for public policies to develop and maintain the Fredericksburg Pathway System.

Goal 1 - Develop a Trail System for Bicycle/Foot Traffic

Objectives:

Provide non-motorized access and coordinated transportation links to neighborhoods, shopping areas, schools, recreation areas, and work places.

Reduce traffic congestion by providing effective transportation alternatives such as a bicycle/foot trails, bicycle lanes, and pedestrian-friendly street crossings.

Develop educational/tourism opportunities through unobtrusive access to natural and cultural resource areas.

Facilitate trail development through public/private partnerships.

Incorporate bicycle routes into construction plans when specified roadways are improved.

Include bicycle routes in the plans for specified new roadways.

Define trail routes and specifications to allow land developers to incorporate them into planned development.

Ensure safe pedestrian access (sidewalks, crosswalks) to all bus stops.

Goal 2 –Maintain Established Trails

Objectives:

Ensure a periodic maintenance program is established for each trail section and trail link (such as bridges and road crossings).

Systematically assess the physical and structural condition of bicycle/foot trails and ensure any required maintenance is accomplished.

Ensure conformity with applicable access standards.

Promote trail use by providing bicycle parking facilities at destination points.

Provide for trails cleanliness by providing trash receptacles at appropriate locations.

Remove encroaching vegetation and tree roots that can damage trails.

Maintain grass borders and trim designated slopes and banks.

Monitor signs, gates, and trash receptacles for vandalism and other damage.

Locate and mitigate erosion problems in a timely manner.

Goal 3 – Promote User Safety

Objectives:

Identify and eliminate operational hazards.

Provide for user safety where at-grade crossings occur.

Enhance public awareness of alternative transportation modes.

Document accident patterns to help determine appropriate safety improvements.

Monitor trees and limbs for unsafe conditions.

Consider the effects of an aging population when replacing/renewing such safety devices as curbs, lane markings, signals, and signs.

Avoid vehicle/pedestrian conflicts by maintaining, as much as possible, a physical separation between bicycle/foot traffic and motor vehicles.

Ensure safe and easy trails use, through adequate signage and trail surface markings.

Provide educational materials to ensure all trail users know the rules of the road.

Remove debris and other obstacles following heavy weather.

Goal 4 – Continue to Improve Trails and Trail Access.

Objectives:

Ensure new development and new activity centers are designed to accommodate bicycle/foot access in the most convenient manner possible.

Establish linkages between the bicycle/foot trail system and new development.

Ensure all new trail sections adhere to established trail specifications and incorporate established sign standards to ensure the individual parts of the system combine to become a cohesive whole.

Ensure trails have only minimal impacts on natural and cultural resources.

Ensure new development can accommodate trails access by obtaining right-of-way at the early stages of the development process.

Encourage site design that supports bicycle/pedestrian access.

PERFORMANCE MEASURES

The following criteria are to be considered for each bicycle/foot trail within the Fredericksburg Pathways system:

Accessibility – A transportation system’s accessibility is measured both by how the system can be physically reached as well as by what destination opportunities are available within a given range (in both space and time). Physical access to the system will be determined by the range encompassed by a 20-minute walk to an origination point. Destination opportunities will be determined by those within a range identified by a 20-minute walk, a 20-minute bicycle ride, or a 20-minute transit trip.

Directness – Bicyclists want direct and quick routes and will not use even the best facility if it unreasonably increases their travel distance or time of travel. Directness is evaluated

by comparing the facility with available alternatives, and the user's needs (recreation or transportation).

Continuity – Any bicycle/pedestrian facility should have as few gaps as possible. Where gaps do exist, they will need to be adapted (with either short term alternatives or long-term solutions) to ensure they do not include areas that are unpleasant or dangerous to the user.

Consistency – Bicycle facilities should be relatively consistent in design (separate path, bicycle lane, etc) within any given corridor. Switching facility types within a corridor can create unsafe conflicts as well as confusion.

Route Attractiveness – Users will be attracted to facilities that are visually pleasing, well maintained, and physically safe. These factors will help users to view trails as a means of transportation and enhance their use.

Low Conflict - Trails networks should minimize conflicts between users and motorists. Physical separation from vehicular traffic, intersection improvements, and adequate trail widths will all serve to reduce conflicts.

Ease of Implementation – Implementation of individual projects is determined by the availability of appropriate right-of-way, the degree of difficulty in coordinating between bicycle facilities and vehicle traffic patterns, and how readily various constraints (environmental, topographic, and funding) can be overcome.

Multimodal Coordination – The effectiveness of various transportation modes is enhanced through a careful coordination of facilities. Multimodal coordination can occur through installation of bicycle racks at specific destinations and in developing facilities to accommodate both bicycles and foot travel.

Multi-jurisdictional Coordination – Fredericksburg area jurisdictions have identified connections between planned bicycle facilities and specified these in regional transportation planning documents. In addition, local jurisdictions are coordinating passage of the East Coast Greenway through the region.

Safety and Security – Facilities need to ensure user safety. This emphasis on safety will include not only facility design and development but the provision of user education and law enforcement.

PROPOSED TRAIL SYSTEM

PATHWAYS SYSTEM OVERVIEW

The Fredericksburg Pathways system is designed to provide non-motorized access throughout the City. Anticipated users include residents traveling to local destinations as well as visitors exploring historic and natural attractions. The overarching theme of accessibility defines the overall pathways, but the individual components of the system will be a variety of trail types, to accommodate and adapt to existing topography and infrastructure.

The most common type of bicycle/pedestrian facility is a separate, but shared-use path, which entails a physical separation between the pathway and vehicular traffic. Separate paths can be within a roadway right-of-way (separated from traffic by a curb, a guard rail, or similar barrier) or can be laid out along an independent right-of-way.

Shared use facilities accommodate cyclists and pedestrians on the same trail. Other facilities, however, are for one type of user only. Sidewalks already provide dedicated walking space, but cyclists need similar consideration. Dedicated bicycle facilities can be established on the roadways themselves. Bicycle lanes in these shared roadways would conform to the existing traffic patterns and adhere to specific design standards.

PROJECT DESCRIPTIONS

Projects are categorized in the following sections by facility type. Each project is then described individually. Details include endpoints, length, type of trail, potential constraints, and a systematic analysis of each facility within the context of established performance criteria.

Separate Shared – Use Trails

A shared-use trail is a bicycle/pedestrian travelway that is physically separated from motorized traffic by open space or a barrier. They are typically designed for two-way travel. The recommended width is 10 feet, with two foot graded shoulders, but they can be wider where heavy volumes of bicycle/foot traffic is anticipated. Such facilities can also be narrower if physical barriers are an issue or if bicycle/pedestrian conflicts will be minimal.

When shared-use trails are located adjacent to a roadway, there should be at least a 5 foot separation between the trail and the road. When this minimum separation is not feasible, a physical barrier should be incorporated, to ensure user safety.

Table 1. Separate Shared-Use Trails

Facility	Route	Length	Page
Embrey Dam/Rappahannock Canal Trail	Fall Hill Avenue to Celebrate Virginia	1.5 to 2.5 miles (depending on tie-in with Celebrate Virginia)	31
Fall Hill Avenue Trail	Canal Park Trail to Carl D. Silver Parkway	1.7 miles	34
Rappahannock River Heritage Trail	Ford Street to the intersection of Canal Park Trail and Fall Hill Avenue	1.5 miles	37
Virginia Central Railway Trail	Rail freight station (406 Lafayette Boulevard) to Interstate-95	3.5 miles	40
North-South Trail	Idlewild to Fall Hill Avenue	1.9 miles	43
Lafayette Boulevard Trail	South City limit to Blue and Gray Parkway	1.5 miles	46
Cowan Boulevard/William Street Connector	Cowan Boulevard at Powhatan Street, to William Street	0.6 miles	49

Embrey Dam/Rappahannock Canal Trail

Type: Separate shared use trail

Location: Fall Hill Avenue to Celebrate Virginia

Length: 1.5 to 2.5 miles, depending upon where it ties in with the Celebrate Virginia project

Description: Establish an independent trail on its own right-of-way along the Rappahannock Canal, past the Embrey Dam site, to Celebrate Virginia.

Construction Conditions: Removal of the Embrey Dam has opened the potential for establishing a multi-use path between the existing Canal Park Trail and the tourism destination of Celebrate Virginia. The link across Fall Hill Avenue is planned to be established with a culvert when the roadway bridge is replaced. Additional considerations will be wetlands and drainage provisions as the trail is established along the river. Care must be taken not to compromise historic resources such as the remaining dam structures and any remnants of the old canal.

Consistency with Applicable Performance Criteria:

Accessibility – The Embrey Dam/Rappahannock Canal Trail will connect a major tourism facility with numerous visitor attractions in downtown Fredericksburg along a scenic route.

Directness – The proposed trail will be the most direct pedestrian/bicycle link possible along the Rappahannock River to the Canal Park Trail.

Continuity – The proposed trail will follow its own right-of-way and will comprise a single entity along its entire length.

Consistency – The proposed trail will be a single facility, with a consistent surface treatment.

Route Attractiveness – This trail will follow the route of an historic canal and extend along the Rappahannock River. The path will be under tree cover. The area where the old Embrey Dam stood is relatively open, but this terrain is expected to grow up quickly in trees within a few years.

Low Conflict – There will be no modal conflicts along this route.

Ease of Implementation – Careful planning during the Embrey Dam removal project resulted in a cleared and graded route that can be readily adapted for a permanent trail. Most of the necessary right-of-way is already in public ownership and the owners of Celebrate Virginia are also interested in establishing a trail, to link their development to downtown Fredericksburg. A single, privately owned property extends across the trail route and must be acquired, either in fee simple or through an easement.

Multimodal Coordination – There are no proposed multimodal connections.

Multi-jurisdictional Coordination – There are no proposed multi-jurisdictional connections.

Safety and Security – Once a culvert is in place at the Fall Hill Avenue bridge, the Embrey Dam/Rappahannock Canal Trail will not have any vehicle conflict points. The trail route does not typically flood, but visitors will need to be cautioned about using the facility when the river is running high.

Map 2. Embrey Dam/Rappahannock Canal Trail.

Fall Hill Avenue Trail

Type: Separate shared-use trail
Location: Canal Park Trail to Carl D. Silver Parkway
Length: 1.66 miles (along roadway); longer if trail follows alternate route
Description: Construct a separate path south of Fall Hill Avenue when that roadway is improved.

Construction Considerations: Improvements to Fall Hill Avenue will be accomplished in conjunction with an extension of Mary Washington Boulevard. This combined project is necessary to preclude adverse traffic impacts to Normandy Village. As a consequence, however, the Fall Hill Avenue Trail will need to cross a four lane divided roadway between the Canal Park Trail and Forest Village Apartments. The gradient of Fall Hill Avenue is also excessive for a bicycle route, so an alternate route behind Forest Village Apartments will need to be considered. A major barrier at Interstate-95 will also need to be overcome.

Consistency with Applicable Performance Criteria

Accessibility – The proposed trail will link the many apartments along Fall Hill Avenue to the Canal Park Trail as well as to the ball fields at Snowden Park and to commercial activity and employment in Central Park.

Directness – The trail will be established within an existing travel corridor, although it may be necessary to route the trail around the back of the Forest Village Apartments. Moving away from the road may be necessary to deal with the terrain, which changes from an elevation of 57 feet at the Canal Path to 250 feet at the Snowden Park ball fields, over the course of 3,300 feet along Fall Hill Avenue.

Continuity – Constructing the trail on the south side of Fall Hill Avenue will reduce modal conflicts. While a road crossing will be necessary at an extended Mary Washington Boulevard, a trail south of Fall Hill Avenue will be on the same side of the road as three major apartment complexes, Snowden Park, and Central Park.

Consistency – A trail in the Fall Hill Avenue corridor can be a single unified facility. Bicycle lanes and sidewalks will be difficult options to implement due to the severe slope. A separate path is the most viable option.

Route Attractiveness – Fall Hill Avenue is a wooded corridor as it rises out of the Canal valley, then loses its tree cover where apartments have been constructed on the uplands. Scenic vistas could be developed in several locations, depending on the selected route.

Low Conflict – The proposed trail would be well separated from the vehicular corridor, but would possibly need to be narrower in some locations due to topographical constraints.

Ease of Implementation – The necessary right-of-way is on private property and will need to be acquired during project implementation.

Multimodal Coordination – The trail should be a shared-use trail, to accommodate both bicyclists and pedestrians.

Multi-jurisdictional Coordination – The proposed trail will connect to other facilities and destinations within the City of Fredericksburg only.

Safety and Security – The Fall Hill Avenue Trail will be separated from vehicular traffic, once it has crossed an extended Mary Washington Boulevard.

Map 3. Fall Hill Avenue Trail

Rappahannock River Heritage Trail

Type: Combination of separate path as well as bicycle lanes.
Location: Ford Street to intersection of Canal Park Trail and Fall Hill Avenue.
Length: 1.5 Miles

Description: Install a crosswalk where the Canal Park Trail meets Princess Anne Street and designate a route to the corner of Ford and Caroline Streets. Construct a separate path on the south side of Caroline Street to Mill Park Terrace, cross Caroline Street at the entrance to Old Mill Park and continue along the north side of Caroline Street and Riverside Drive, from the entrance of Old Mill Park to the intersection of Riverside Drive and Wellford Street. Install a crosswalk at Wellford Street and install a bicycle lane along Wellford Street, Hanson Avenue, and Normandy Avenue to its intersection with Fall Hill Avenue.

Construction Considerations: The corner of Ford and Caroline Streets will need to be bumped out to accommodate a trail around the corner of a stone retaining wall. The trail on the south side of Caroline Street avoids wetlands impacts. By crossing to the north side of Caroline Street, at the entrance to Old Mill Park, the trail avoids any conflicts with driveways or other curb cuts. A change in elevation occurs in the vicinity of the Falmouth Bridge. At Wellford Street, there are two options. The most cost effective alternative is to establish bicycle lanes on Wellford Street to Hanson Avenue, along Hanson Avenue to Normandy Avenue, and along Normandy Avenue to Fall Hill Avenue. This route would be 1,950 feet long (.37 miles). The alternative route would be to maintain the separate path on the north side of the road and continue for 2,600 feet (.49 miles) from Wellford Street to the Rappahannock Canal. This option has a major obstacle to overcome where the Rappahannock River cuts in close to Fall Hill Avenue.

Consistency with Applicable Performance Criteria

Accessibility – The proposed trail will connect Old Mill Park and the Canal Park Trail, increasing the accessibility of the surrounding neighborhoods to both of these recreational opportunities.

Directness – The new trail will follow existing roadways which are already well used travel corridors.

Continuity – A crosswalk will need to be established at Princess Anne Street, to link the existing Canal Park Trail to Ford Street. Another crosswalk will be needed at Mill Park Terrace, to link this trail to Old Mill Park and the Riverside Drive Trail. Locating the separate trail between the Rappahannock River and the roadway ensures that there will be no breaks in that section of this facility. The bicycle lanes will follow an existing roadway with crosswalks needed at Riverside Drive and Wellford Street and at Hanson Avenue and Fall Hill Avenue. There is a bridge across the Rappahannock Canal, connecting the Canal Trail to Normandy Avenue, as well as a bridge across the Canal adjacent to Fall Hill Avenue.

Consistency – A shared use path will be approximately the same width as the Canal Park Trail and can be kept consistent along Caroline Street, from the corner of Ford Street to Mill Park Terrace. The route down Ford Street will need to be accommodated along the sidewalk or within the roadway as a bicycle lane. This trail entails two types of facilities, a separate shared use path as well as bicycle lanes. The transition from one to the other occurs at a corner, however, allowing a user to adapt to the change. The alternate route that would continue the separate path along the river would overcome this change in facility types.

Route Attractiveness – The proposed path will be located within the scenic Rappahannock River corridor. It will pass through a wooded corridor, interspersed with historic mill sites and then break out on river bluffs overlooking the river.

Low Conflict – Establishing the trail on the west side of Caroline Street avoids wetlands and the entry drive to Old Mill Park. A proposed townhouse development on the west side of the road will introduce a 30-foot wide driveway that will need to be crossed. The path on the north side of Riverside Drive, will avoid driveways or breaks in the curb. The bicycle lanes are routed to Hanson Avenue, in order to avoid the dangerous crossing (due to inadequate sight distance) at Riverside Drive and Fall Hill Avenue.

Ease of Implementation – Right-of-way for the proposed trail will need to be acquired. The proposed townhouse development provided an eight-foot wide trail alignment across their frontage, which will accommodate approximately 250 feet of the trail. The necessary rights-of-way are on publicly owned property. The alternative route continues the separate shared use path past Wellford Street, following Riverside Drive to Fall Hill Avenue. The trail would be routed between these roads and the river, avoiding street crossings, but requiring a substantial boardwalk type structure where the river cuts in close to the roadway. This structure will need to be strong enough to withstand flooding and shearing since the river flow exerts a direct impact on this vulnerable site.

Multimodal Coordination – The trail will be a pedestrian/bicycle route.

Multi-jurisdictional Coordination – The proposed trail will connect to other facilities and destinations within the City of Fredericksburg only.

Safety and Security – Most of the trail will be a path that is physically separated by a curb from vehicular traffic. The section of this route that must be developed on-street will adhere to standard bicycle lane criteria. A guardrail will be needed at the corner of Ford and Caroline Streets, where the trail will be narrow because of the existing stone retaining wall.

Map 4. Rappahannock River Heritage Trail.

Virginia Central Railway Trail

Type: Separate shared use trail

Location: Old railroad freight station (at 406 Lafayette Boulevard) to the west City Limit at Interstate-95.

Length: 3.5 miles

Description: Construct a trail along the rail bed of the historic Virginia Central Railway. This recreational corridor extends beyond the City limits for another 30 miles to the Town of Orange.

Construction Considerations: Most of this trail route is a graded rail bed, where the rails and ties have been removed. Some areas have eroded, however, and others have been altered by earth moving associated with nearby development. Significant man-made barriers exist at the Blue and Gray parkway and the Jefferson Davis Highway. The right-of-way also crosses Hazel Run in four locations. One crossing, at Lafayette Boulevard already has a bridge with a sidewalk on one side and room for a shared use path on the other. The three additional Hazel Run crossings occur between I-95 and Jefferson Davis Highway and have a combination of stone and concrete abutments in place that can potentially be reused. When the trail is extended into Spotsylvania County, a crossing will be needed at Interstate-95.

Consistency with Applicable Performance Criteria:

Accessibility – The trail will be accessible from downtown Fredericksburg and residential neighborhoods, including the Idlewild development.

Directness – The trail will open up a new travel route from the Idlewild development to downtown Fredericksburg.

Continuity – This trail will provide exceptionally long sections of uninterrupted travel. Intersections will occur at the Route 1 Bypass (Jefferson Davis Highway) and the Blue and Gray Parkway.

Route Attractiveness – The trail courses through mature woods, a battlefield, as well as historical urban areas. The route generally follows Hazel Run and presents numerous opportunities for historical interpretation.

Low Conflict – Conflict will occur primarily at the trail's urban end, requiring coordination with commercial parking lots and crossings at two busy intersections (Blue and Gray Parkway and Jefferson Davis Highway).

Ease of Implementation – A large portion of the required right-of-way is publicly owned. Construction will be relatively basic on the sections of the right-of-way that are intact, but eroded and disturbed areas will require additional effort to make them usable. Major obstacles will be the two busy highways.

Multimodal Coordination – This trail will connect several residential areas with the downtown rail station. Additional bicycle parking facilities will need to be placed at the rail station when this project is completed.

Multi-jurisdictional Coordination – The Virginia Central Railway bed extends from Fredericksburg through Spotsylvania County, to Orange County. Each jurisdiction has expressed interest in the potential for a recreational trail to extend its full length.

Safety and Security – The existing bridge abutments at the Hazel Run crossings will need to be evaluated for their suitability for reuse. User safety at the two roadway crossings is also critical.

Map 5. Virginia Central Railway Trail

North-South Trail

Type: Separate shared use trail

Location: Idlewild to Fall Hill Avenue

Length: 1.9 miles – 0.45 miles from Hazel Run to Route 3; 0.70 miles from Route 3 to Cowan Boulevard; 0.75 miles from Cowan Boulevard to Fall Hill Avenue.

Description: Incorporate a bicycle lane on Altoona Drive. Incorporate a separate shared use trail along one side of an extended Mahone Drive and a sidewalk along the other side.

Construction Considerations – Altoona Drive is an established roadway that has no sidewalks. Mahone Street is planned as a developer funded project. Actual construction will depend on the private need for this roadway during the development process.

Consistency with Applicable Performance Criteria:

Accessibility – The proposed trail will provide a critical north-south link, between the Idlewild and Altoona neighborhoods and Cowan and Fall Hill Avenues.

Directness – The trail will follow Altoona Drive from Hazel Run to Route 3 and then a proposed travel corridor between Route 3 and Fall Hill Avenue

Continuity – The trail will connect with similar facilities at Cowan Boulevard and Fall Hill Avenue. A Route 3 crossing is a major problem, but a critical need. The trail will also connect with the Idlewild trails system.

Consistency – The trail on Altoona Drive will be a shared roadway. The trail north of Route 3 will be similar to the shared use path on Cowan Boulevard.

Route Attractiveness – Altoona and Idlewild are wooded neighborhoods. The route will need to negotiate a commercial area near Route 3, but will run adjacent to a preserved and wooded historic area near Cowan Boulevard. Additional wooded areas will remain intact north of Cowan Boulevard.

Low Conflict - This trail route is not yet developed, but potential conflicts are anticipated near Route 3 and at the intersection with Cowan Boulevard.

Ease of Implementation – The necessary right-of-way will be obtained and the planned facilities constructed by private developers, as Mahone Street is constructed. The trail in Altoona will follow an existing road.

Multimodal Coordination – The trail will accommodate both bicycle and foot travel.

Multi-jurisdictional Coordination – There are no opportunities for multi-jurisdictional links with this project.

Safety and Security – The trail north of Route 3 will be separated from the vehicle travel lanes. Intersections will be signaled and signed. The trail south of Route 3 will be clearly marked.

Map 6. North-South Trail

Lafayette Boulevard Trail

Type: Separate shared use path

Location: South City limit to the Virginia Central Railway trail connection at the Blue and Gray Parkway

Length: 1.5 miles

Description: Incorporate a sidewalk on one side of Lafayette Boulevard and a shared use trail on the other side, when that roadway is widened and improved.

Construction Considerations – Improvements to Lafayette Boulevard will need to be coordinated with the existing Blue and Gray Parkway. A bicycle lane and a sidewalk are already in place at the Hazel Run bridge. From the Hazel Run bridge, an off-road connection will need to be made to the Virginia Central Roadway bed that continues into downtown Fredericksburg.

Consistency with Applicable Performance Criteria:

Accessibility – The proposed sidewalk and trail will link numerous neighborhoods along Lafayette Boulevard with downtown Fredericksburg and the rest of the pathway system. This trail would also offer potential links to schools.

Directness – The sidewalk and trail will be established within an established travel corridor that is already very heavily used. Because of property ownership issues and topographic limitations, there will be no opportunities for deviating from the existing right-of-way. Consequently, the pedestrian/bicycle facilities will bear the full brunt of a significant change in elevation between Hazel Run (38 feet) and the uplands (220 feet) that occurs over a distance of only 3,500 feet.

Continuity – Lafayette Boulevard is accessed by numerous subdivision roads and driveways. Modal conflicts will characterize much of this route, but providing bicycle/pedestrian facilities is critically important as this road is already heavily used by people on foot and on bicycles. The many roads and driveways can also be viewed as access points to the proposed sidewalk and trail.

Another significant trail along the Central Virginia Railway route, from the Idlewild development, will connect to the Lafayette Boulevard trail just east of the Blue and Gray Parkway.

Consistency – A sidewalk and a bicycle trail can be kept consistent through the Lafayette Boulevard corridor. This standardization will support a consistent use of safety features, which will enhance their effectiveness.

Route Attractiveness – Lafayette Boulevard retains an eclectic local charm that has not been overwhelmed by national retailers. It is a developed route except for a section that is fronted by a National Park (Fredericksburg Battlefield).

Low Conflict – As noted above, there will be numerous conflicts with subdivision roads and driveways. A comprehensive safety program will need to be implemented during construction of the sidewalk and the shared use trail.

Ease of Implementation – The sidewalk and trail rights-of-way will be acquired in conjunction with the road improvement project.

Multimodal Coordination – A Lafayette Boulevard sidewalk and shared use trail will provide access to the downtown rail station, which provides both AMTRAK and VRE service. Bicycle racks were installed at the rail station in 1996 and additional bicycle parking facilities can be added when this trail is completed.

Multi-jurisdictional Coordination- The Lafayette Boulevard bicycle trail could be readily extended into Spotsylvania County should that jurisdiction decide to develop similar facilities. This section of Lafayette Boulevard may also become part of the East Coast Greenway (discussed further under Regional Connections).

Safety and Security – The proposed sidewalk and shared use trail will be constructed within a busy vehicular corridor with more than a dozen connector and subdivision roads along the way. Appropriate striping, barriers (including trees), and signs will be needed to ensure user safety. The crossing at the Blue and Gray Parkway will be important for both the Lafayette Boulevard Trail as well as the Central Virginia Railway Trail, from Idlewild.

Map 7. Lafayette Boulevard Trail

Cowan Boulevard/William Street Connector

Type: Separate shared use trail

Location: Along Cowan Boulevard, from Powhatan Street, across the Jefferson Davis Highway and extending to William Street.

Length: .6 miles

Description: Extend the Cowan Boulevard shared use trail to Jefferson Davis Highway, provide a signalized crossing across the highway, and continue construction of a shared use path to William Street, either following the existing power easement to Rappahannock Avenue or using Spotsylvania Avenue.

Construction Considerations: The right-of-way along Cowan Boulevard is cleared. Safe crossings will need to be established at Powhatan Street/Keeneland Road and at Jefferson Davis Highway. The route between Jefferson Davis Highway and William Street will require permission from Virginia Power to establish a trail within their easement. If Rappahannock Avenue is used, a short connection will need to be made from the end of that street to William Street. A short segment of connecting sidewalk will also need to be constructed along the north side of William Street, between High Street and the Blue and Gray Parkway.

Consistency With Applicable Performance Criteria

Accessibility – This connector will be accessible from neighborhoods and apartment complexes on both sides of Jefferson Davis Highway.

Directness – The trail will provide an important north-south link in the shortest distance possible.

Continuity – Two barriers exist along this alignment at Powhatan Street/Keeneland Road and Jefferson Davis Highway. Both can be overcome with crosswalks.

Consistency - The trail will be identical to the existing Cowan Boulevard shared use path.

Route Attractiveness – This connector will be a utilitarian route that will link different portions of the overall pathway system. There are no anticipated opportunities for vistas or interpretive panels.

Low Conflict – Conflicts with motorized vehicles will occur at both proposed intersections.

Ease of Implementation – Permission will be needed from both Virginia Power (for use of their easement) and from private property owners.

Multimodal Coordination – The trail will accommodate both bicycle and foot travel.

Multi-jurisdictional Coordination - There are no opportunities for multi-jurisdictional links.

Safety and Security – The trail will be separated from vehicle travel lanes except at the two intersections. Appropriate striping and signs will be needed at Powhatan Street/Keeneland Road. Striping and signalization will be needed at Jefferson Davis Highway.

Map 8. Cowan Boulevard/William Street Connector

Shared Roadways

On road bicycle facilities provide the most effective bicycle network because they connect with everything that is accessible by motor vehicle. Their limitation is that they should not be used by pedestrians. Pedestrian access should continue to be provided through sidewalks and shared-use trails. The road width is the critical variable for a roadway to be able to accommodate bicycle travel.

Shared Roadway-Paved Shoulders – There are four basic shared roadway facilities. The first are paved shoulders, consisting of roadway shoulders that are at least four feet wide, to accommodate bicycle travel. Such features are suited to roads without curb and gutter and where vehicular volumes and speeds are high. The roads within the City of Fredericksburg that would be appropriate for paved shoulders would be routes that extend into the neighboring counties, such as Route 2/17.

Shared Roadway-Wide Outside Lane – Another type of shared roadway facility is called a wide outside lane. Roads without designated bicycle lanes, but with an outside or curb lane wider than 12 feet, can accommodate bicycle travel. A 14 foot wide lane width, not including the gutter pan, is recommended for shared use. Wider lanes can be useful to address specific conditions such as steep grades or potential hazards, but the lane should be brought back to no more than 14 feet again, to discourage two motor vehicles from using one lane.

Signed Shared Roadway – Preferred bike routes are designated with signs, to indicate to users that the route has advantages over alternatives. These routes are not necessarily ideal, but provide continuity to other (better) facilities, mark a common route for bicyclists through a busy corridor, and alert motorists of bicycle activity.

Shared Roadways-Bicycle Lanes – Bicycle lanes are incorporated into a roadway design and are quite appropriate in urban and suburban settings. Bicycle lanes should be one-way facilities, carrying bike traffic in the same direction as motor vehicle traffic. If on-street parking is permitted, the bicycle lane should be placed between the parking lane and the travel lane. Bicycle lanes should never be placed between the parking lane and the curb. A minimum of 13 feet should be allowed for a combined parking and bicycle lane, with the pavement striped to delineate the two uses.

The recommended width for bicycle lanes will vary, depending on roadway configuration as well as traffic volumes. The following are minimum widths for bicycle lanes:

- Four feet on roads with a curb and gutter
- Five feet where bike lanes are adjacent to on street parking or other static obstructions.
- Six feet where vehicle speeds exceed 50 mph or substantial truck traffic is present.

Table 2. Shared Roadways

Facility	Route	Length	Page
Springwood Drive Trail	Lafayette Boulevard to Virginia Central Railway	0.4 miles	54
Downtown Loop	Downtown to Canal Park Trail and back	2.6 miles	56
Alum Springs Loop	Downtown to Alum Springs Park and back	3.5 miles	58
Downtown-Dixon Park Route	Downtown to Dixon Park and back	1.5 miles	60

Springwood Drive Trail

Type: Shared Roadway
Location: Lafayette Boulevard to Virginia Central Railway Trail
Length: 0.4 miles
Description: On-road bicycle lanes on the Springwood Drive pavement

Construction Considerations: The proposed bicycle lanes will share the Springwood Drive pavement. A short connecting link will need to be established at the end of Springwood Drive, to connect to the Virginia Central Railway Trail.

Consistency with Applicable Performance Criteria:

Accessibility – This trail will connect directly to the Virginia Central Railway Trail in Alum Springs Park.

Directness – Springwood Drive will reduce travel time between residential neighborhoods along Lafayette Boulevard and Alum Springs Park and the Virginia Central Railway Trail.

Continuity – This trail will provide a direct connection between two planned pedestrian/bicycle facilities (Lafayette Boulevard Trail and the Virginia Central Railway Trail).

Consistency – The Springwood Drive Trail will consist of bicycle lanes on an existing roadway, to link two trails that are proposed to be separated from any roads.

Route Attractiveness - This relatively short link will be more functional than attractive.

Low Conflict – This short link will occur on a quiet neighborhood street. Clear striping on the road surface will minimize conflict between cyclists and vehicular traffic.

Ease of Implementation – The proposed facility will be established on existing public right-of-way. The link between the road ending and Alum Springs Park, however, will need to be acquired and improved.

Multimodal Coordination – There are no opportunities for multimodal connections.

Multi-jurisdictional Coordination – There are no opportunities for inter-jurisdictional connections.

Safety – A crosswalk will be established at Lafayette Boulevard, with all necessary signage. Provision of this short cut between the planned Lafayette Boulevard Trail and the Virginia Central Railway Trail will allow pedestrians/cyclists to avoid the Lafayette Boulevard/Blue and Gray parkway intersection area if they do not need to cross there.

Map 9. Springwood Drive Trail

Downtown Loop

Type: Shared Roadway

Location: Downtown to Canal Park Trail and back

Length: 2.6 miles

Description: On-road bicycle lane running north along Sophia and Caroline Streets to the Canal Park Trail then south from the Canal Park Trail along Prince Edward Street, across Lafayette Boulevard to Charles Street and back to Sophia Street, via Frederick Street.

Construction Considerations: This designated bicycle trail will consist of painting on-road bicycle lanes traveling one way only along the specified route. Appropriate signs will also need to be installed and painted on the roadway.

Consistency with Applicable Performance Criteria

Accessibility – This facility will provide a bicycle link between Downtown and the Canal Park Trail.

Directness – The bicycle lanes follow existing roadways.

Continuity – The loop will provide bicycle lanes along existing City streets.

Route Attractiveness – The route is on historic downtown streets, with river views along Sophia Street.

Low Conflict – On-road bicycle lanes are open to conflict between cyclists and motor vehicles, but potential problems can be reduced by clearly marked bicycle lanes and appropriate signs.

Ease of Implementation – Establishing this route along Sophia Street will require that vehicular parking along the north side of Sophia Street be eliminated. In practical terms, however, few spaces will be lost. Caroline and Prince Edward Streets are wide enough for a one-way bicycle lane on one side of the street, outside the parking lane.

Multimodal Coordination – There are no opportunities for multimodal coordination.

Multi-jurisdictional Coordination – The downtown loop will connect to the Chatham Bridge link to Stafford County.

Safety – Properly marked bicycle lanes and appropriate signage are key determinants of user safety. An evaluation of each traffic signal along this route is also in order, to ensure pedestrian/bicycle safety. Finally, Prince Edward Street should be evaluated for traffic calming devices.

Map 10. Downtown Loop

Alum Springs Loop

Type: Shared Roadway
Location: Downtown to Alum Springs Park and back
Length: 3.5 miles
Description: On-road bicycle lane running west along Amelia and William Streets to the Blue and Gray Parkway. Continue along Greenbrier Drive to Alum Springs Park. Return along Greenbrier Drive and Hanover Street.

Construction Considerations: This designated bicycle trail will consist of painting on-road bicycle lanes along the specified route and installation of appropriate signs

Consistency with Applicable Criteria:

Accessibility – This facility will provide a bicycle link between Downtown and Alum Springs Park.

Directness – The bicycle lanes will follow existing roadways.

Continuity – There are no gaps along the proposed route.

Consistency – The loop provides bicycle lanes on existing City streets. Some sections, however, may be too narrow for marked lanes and will need to be designated as marked bicycle routes only.

Route Attractiveness - The route begins and ends in historic downtown Fredericksburg and travels into the wooded Greenbrier Drive corridor and Alum Springs Park.

Low Conflict – On-road bicycle lanes are open to conflict between cyclists and motor vehicles, but potential problems can be reduced by clearly marked bicycle lanes and appropriate signs. Hanover Street, however, is not wide enough for bicycle lanes, east of Kenmore Avenue, so this section of the route will need to be designated a marked bicycle route only.

Ease of Implementation – Establishing this route will require careful attention to the William Street/Blue and Gray Parkway intersection and to the Hanover Street corridor (which is not wide enough to accommodate a bicycle lane).

Multimodal Coordination – There will be no opportunities for multimodal connections.

Multi-jurisdictional Coordination – There will be no opportunities for multi-jurisdictional connections.

Safety – Properly marked bicycle lanes and appropriate signage are key determinants of user safety. An analysis of the William Street/Blue and Gray Parkway intersection is needed and further evaluation of the Hanover Street corridor is warranted.

Map 11. Alum Springs Loop

Downtown-Dixon Park Route

Type: Shared roadway

Location: Downtown to Dixon Park and back

Length: 1.5 miles

Description: On-road bicycle lane running along Princess Anne Street to Dixon Street and then to Dixon Park. Return along Dixon and Caroline streets.

Construction Considerations – This designated bicycle trail will consist of painting on-road bicycle lanes along the specified route and installation of appropriate signs.

Consistency with Applicable Criteria:

Accessibility – This facility will provide a bicycle link between Downtown and Dixon Park.

Directness – The bicycle lanes will follow existing roadways.

Continuity – There are no gaps along the proposed route.

Consistency – The proposed trail provides bicycle lanes on existing City streets.

Route Attractiveness – The route travels through downtown neighborhoods. The Dixon Street corridor, however, is a very basic thoroughfare.

Low Conflict – On-road bicycle lanes are open to conflict between cyclists and motor vehicles, but potential problems can be reduced by clearly marked bicycle lanes and appropriate signs.

Ease of Implementation – The proposed trail can be established on existing public right-of-way.

Multimodal Coordination – The proposed route passes the downtown rail station.

Multi-jurisdictional Coordination – The Dixon Street portion of this trail could potentially be extended into Spotsylvania County, to provide a bicycle component on the Tidewater Trail (Route 2/17)

Safety – Properly marked bicycle lanes and appropriate signage are key determinants of user safety.

Map 12. Downtown-Dixon Park Route

Nature/Historic Sites Trails

Nature trails are an integral part of the pathways system. They offer residents an opportunity to get away from the streets and traffic and walk in areas that are largely unaffected by the urban landscape. Nature trails are narrower than shared-use trails, with a width not exceeding four feet. They have a natural surface and follow the contours of the natural terrain. Their construction has a minimal impact on the environment. Users are generally walkers and hikers, although some nature trails may be open to mountain bikers.

Table 3. Nature/Historic Sites Trails

Facility	Route	Length	Page
Celebrate Virginia Trails	Visitor trailheads to Embrey Dam/Rappahannock Canal Trail	Various	63
Hazel Run Trail	Rappahannock River to Interstate-95	4.6 miles	64
Fall Hill Greenway	Canal Park Trail to Snowden Park	1.0 miles	65
Idlewild Trails	Housing clusters to Virginia Central Railway Trail and to Hazel Run Trail	Various	66
Smith Run Trail (Extension)	Existing trail end into future Smith Run Battlefield Park	0.3 miles	67
Dixon Park Trail	Caroline Street to Dixon Park	0.6 miles	68
Rappahannock River Trails	Along riverbank in various locations	Not yet determined	69

Celebrate Virginia Trails

Type: Nature and historic sites trail system

Location: Easement area of Celebrate Virginia, South.

Length: To be determined

Description: A trails network will be developed within the Celebrate Virginia easement area, to link visitor lodging with natural areas and historic sites between the uplands and the Rappahannock River.

Consistency with Selected Performance Criteria:

Accessibility – The trails network will be accessible from visitor accommodations in Celebrate Virginia. A link to the Embrey Dam/Rappahannock Canal Trail will also connect this trails network with the rest of Fredericksburg that lies east of I-95.

Continuity – The trails network will include a variety of trail types. Some will be somewhat primitive, for hiking only. Others will accommodate bicycles and some will be shared-use facilities.

Route Attractiveness – The trails will course through wooded uplands, across floodplains, and along the intervening slopes with scenic views of the Rappahannock River. The trails will also provide access to historic sites.

Ease of Implementation – The trails network will be established on a floodplain (prone to periodic flooding) as well as on the slopes between the floodplain and the uplands (prone to erosion). Trail construction and selection of trail surfaces will be needed to address both areas of concern.

Safety and Security – The trails will be located within a visitor/tourism campus.

Hazel Run Trail

Type: Primitive hiking trail

Location: Along Hazel Run, from the Rappahannock River to Interstate-95.

Length: 4.6 miles

Description: Establish a foot path along Hazel Run, following natural terrain contours.

Consistency with Selected Performance Criteria:

Accessibility – The trail would be accessible from Dixon Park, Old Walker-Grant School, Alum Springs Park, the Altoona and Idlewild neighborhoods, and portions of the Virginia Central Railway Trail.

Continuity – The trail will be a primitive hiking trail that will connect to similar trails from Altoona and Idlewild. It will need to share the Central Virginia Railway shared-use Trail alignment in some areas where a separate trail is not feasible.

Route Attractiveness – Hazel Run is a perennial stream in a wooded setting. There are numerous vistas and rock outcroppings. Historic sites include an extensive Confederate winter encampment site and the Virginia Central Railway bed.

Ease of Implementation – The trail route will be within the Hazel Run Resource Protection Area, a Chesapeake Bay Program designation that allows passive recreational facilities such as pathways. Hazel Run is subject to severe erosion due to inadequate stormwater management at the Spotsylvania Mall. As a consequence, any trail improvements will need to be able to withstand these impacts.

Safety and Security – A natural path in an isolated woodland setting is open to abuse. A primitive trail can also be hazardous to careless hikers. The characteristics of the trail will need to be posted at its access points.

Fall Hill Greenway

Type: Natural walking trail

Location: Canal Park Trail, at Fall Hill Avenue, to Hills at Snowden and back to Fall Hill Avenue Trail.

Length: 1.0 miles

Description: Establish a natural surface foot path along an unnamed streambed.

Consistency with Selected Performance Criteria:

Accessibility – The trail will be accessible to the Hills at Snowden neighborhood and link them to the larger city-wide trails system.

Continuity – The trail will provide an unsurfaced, primitive link to surfaced shared-use trails along the Rappahannock Canal (Canal Park Trail) and Fall Hill Avenue.

Route Attractiveness – The trail will follow a natural streambed through wooded terrain.

Ease of Implementation – This trail route is within a Resource Management Area, a Chesapeake Bay program designation that allows passive recreational facilities such as pathways. Attention will need to be directed at avoiding erosion during construction and subsequent trail use.

Safety and Security – A natural path in an isolated setting is open to abuse. The characteristics of the trail will need to be posted at its access points.

Idlewild Trails

Type: Hiking trails system

Location: Preserved natural areas within the Idlewild development.

Length: Various

Description: A trails network will be developed within the Idlewild development, to accommodate nature walks, access to historic sites, and to provide a link to the Virginia Central Railway Trail.

Consistency with Selected Performance Criteria:

Accessibility – The trails network will be accessible from the Idlewild neighborhoods. A link to the Virginia Central Railway will connect this development with downtown Fredericksburg.

Continuity – The trails network will primarily consist of hiking trails. The link to the Virginia Central Railway Trail, however, will need to accommodate bicycle riders as well.

Route Attractiveness – The trails will run through natural areas that exhibit the characteristics of the transition zone between the Virginia Piedmont and Tidewater region. The setting is a wooded area with numerous rock outcroppings. The Virginia Central Railway is also a significant and substantial historic feature, with granite culverts that are still functional.

Ease of Implementation – The trails network will be established in areas with moderate slopes. Trail construction will need to ensure that conditions are not created that will cause subsequent erosion.

Safety and Security – The trails will be established around a populated residential neighborhood.

Smith Run Trail (extension)

Type: Natural and historic sites trail
Location: Smith Run valley
Length: 0.3 miles
Description: Extend an existing foot trail into a battlefield preservation area.

Consistency with Selected Performance Criteria:

Accessibility – This hiking trail is accessible from Hugh Mercer School as well as the Great Oaks neighborhood (by crossing the earthen dam at a stormwater pond on Smith Run).

Continuity – The extended trail will be a natural foot path, consistent with the existing foot path.

Route Attractiveness – The trail will remain in a wooded area, while extending into a historic area that will be interpreted through wayside exhibit panels.

Ease of Implementation – Establishing a footpath through a mature woodland is readily accomplished with hand tools. Trail construction will need to ensure that conditions are not created that will cause subsequent erosion.

Safety and Security – The proposed trail will extend into an area that will become a public park.

Dixon Park trail

Type: Nature trail

Location: The southern end of Caroline Street to Dixon Park

Length: 0.6 miles

Description: Construct a foot trail along the Rappahannock River from the lower end of Caroline Street, across Hazel Run, across the outfall of the municipal wastewater treatment plant, to Dixon Park.

Consistency with Selected Performance Criteria:

Accessibility – This trail will be accessible from neighborhoods and apartments.

Continuity – This trail cannot be used without comprehensively addressing each obstacle (Hazel Run, wastewater treatment plant outfall, change in elevation). Once completed, the trail will have no gaps.

Route Attractiveness – The trail will course through a wooded floodplain with numerous river vistas. No wayside exhibit panels will be installed within any floodplain, though.

Ease of Implementation – The proposed trail route lies within the floodplain of both the Rappahannock River and Hazel Run, so the trail surface will need to be able to withstand routine flooding. In addition, a substantial bridge will be needed at Hazel Run which can withstand the combined flood flows of Hazel Run as well as the Rappahannock River. A second bridge will be needed to cross the outfall of the municipal wastewater treatment plant. Switchbacks will also be needed to bring the trail from the floodplain (13 feet above mean sea level) to the recreational complex plateau (50 feet above mean sea level).

Safety and Security – The trail will not be safe at times of high water. In addition, a natural path in an isolated setting is open to abuse. The characteristics of the trail will need to be posted at its access points.

Rappahannock River Trails

Type: Primitive hiking trails
Location: Within the Rappahannock River corridor
Length: To be determined.
Description: Establish foot trails, as feasible, along the Rappahannock River.

Consistency with Selected Performance Criteria:

Accessibility – Due to the topography of the river corridor, available access points are limited. Providing any additional access is carefully planned, to maintain the natural integrity of the river resource.

Continuity – A primitive trail will have no gaps, but the terrain varies and so will the difficulty of the trail.

Route Attractiveness – The Rappahannock River corridor is an intact natural area, replete with historic resources.

Ease of Implementation – The trail will course through primitive country where heavy equipment will not be available to modify the terrain. Riparian property owned by the City of Fredericksburg rarely includes the flat upland areas. The public lands are more readily characterized by steep slopes, rock cliffs, wetlands, and visible (as well as underground) historic resources. These conditions will require careful planning and close supervision during any trail building activity. In some areas, the only viable trail route may be on private property and permission will be required if that alignment is to be used.

Safety and Security – The trail will be characterized by isolation and difficult terrain. The characteristics of the trails will need to be posted at their access points.

REGIONAL CONNECTIONS

Chatham Bridge Link

Type: Safety improvements to an existing facility
Location: The existing bridge spans the Rappahannock River, connecting the City of Fredericksburg and Stafford County.
Length: 0.16 miles
Description: The Chatham Bridge is a concrete structure that accommodates four lanes of traffic and has narrow 4-foot sidewalks on either side. Unless a new pedestrian bridge is to be constructed, planning must focus on adapting the existing structure to enhance pedestrian/cyclist safety. Options include guard rails (or similar device) on the existing sidewalks, to provide a physical barrier between pedestrians and vehicular traffic. The other option would be to redeck the bridge, reducing the four lanes to three, which would allow the narrow sidewalks to be expanded to a more suitable width.

Consistency with Applicable Performance Criteria

Accessibility – There are very few links across the Rappahannock River that are suitable for pedestrians and bicyclists. Of the four existing bridges (I-95, Falmouth, Chatham, and Mayfield), only two can be used by pedestrians/bicyclists (Chatham and Falmouth). As a consequence, both bridges need to be enhanced for accessibility and safety as much as is practicable.

Directness – The Chatham Bridge is a direct link between the two jurisdictions.

Continuity – The sidewalks on the Chatham Bridge tie in directly with the City sidewalks. Connections will need to be established on the Stafford side, when that jurisdiction establishes its riverside trails to Falmouth and to Ferry Farm.

Consistency – The existing bridge sidewalks are very narrow. Bicyclists need to dismount and walk their bikes across.

Route Attractiveness – The Chatham Bridge crosses the scenic Rappahannock River. There are vistas looking up river and down as well as views of historic downtown Fredericksburg.

Low Conflict – Because the bridge sidewalks are narrow, the potential exists for numerous conflicts. The historic bridge, however, cannot be easily widened. Initial plans are to install guard rails along the bridge sidewalks. Another option for reducing pedestrian/bicycle conflicts with motor vehicles would be to reconfigure the bridge to three vehicle lanes and widen the existing sidewalks.

Ease of Implementation – The physical constraints of the bridge will challenge implementation of this link. Redecking and expanding the sidewalks would be the most expensive option, but could also be the most effective. A simpler option would be to leave the existing sidewalks intact and install guardrails. These barriers would protect the pedestrians/cyclists as well as reduce vehicle speeds on the bridge.

Multimodal Coordination – Multimodal coordination will not be feasible on this relatively short link.

Multi-jurisdictional Coordination – The Chatham Bridge provides a much needed pedestrian connection between Fredericksburg and Stafford. This link is already the Bike 1 Route and is also the proposed route of the East Coast Greenway.

Safety and Security – The Chatham Bridge already has sidewalks on either side, but they are extremely narrow. A physical barrier between the sidewalks and the vehicle lanes is a critical component of this project, whether the bridge retains its four vehicle lanes or is reconfigured to three lanes.

Falmouth Bridge Link

Type: Safety improvements to an existing facility
Location: The existing bridge spans the Rappahannock River, connecting the City of Fredericksburg and Stafford County.
Length: 0.16 miles
Description: The Falmouth Bridge is a concrete structure that accommodates four lanes of traffic and has narrow 4-foot sidewalks on either side. Unless a new pedestrian bridge is to be constructed, planning must focus on adapting the existing structure to enhance pedestrian/cyclist safety. Options include guard rails (or similar device) on the existing sidewalks, to provide a physical barrier between pedestrians and vehicular traffic.

Consistency with Applicable Performance Criteria

Accessibility – There are very few links across the Rappahannock River that are suitable for pedestrians and bicyclists. Of the four existing bridges (I-95, Falmouth, Chatham, and Mayfield), only two can be used by pedestrians/bicyclists (Chatham and Falmouth). As a consequence, both bridges need to be enhanced for accessibility and safety as much as is practicable.

Directness – The Falmouth Bridge is a direct link between the two jurisdictions.

Continuity – The sidewalks on the Falmouth Bridge tie in directly with the City sidewalks. Connections will need to be established on the Stafford side, when that jurisdiction establishes its own riverside trails.

Consistency – The existing bridge sidewalks are very narrow. Bicyclists need to dismount and walk their bikes across.

Route Attractiveness – The Falmouth Bridge crosses the scenic Rappahannock River adjacent to an historic ford. There are vistas looking up river and down as well as views of historic Falmouth.

Low Conflict – Because the bridge sidewalks are narrow, the potential exists for numerous conflicts. One option would be to install guard rails along the bridge sidewalks. If the Falmouth Bridge is ever expanded or replaced, suitable accommodations will need to be made for pedestrians and cyclists.

Ease of Implementation – The physical constraints of the bridge will challenge implementation of this link. Removing a lane of traffic is not an option on this busy roadway. Installation of guardrails on the existing sidewalks would protect the pedestrians/cyclists as well as reduce vehicle speeds on the bridge.

Multimodal Coordination – Multimodal coordination will not be feasible on this relatively short link.

Multi-jurisdictional Coordination – The Falmouth Bridge will provide a much needed pedestrian connection between Fredericksburg and Stafford.

Safety and Security – The Falmouth Bridge already has sidewalks on either side, but they are extremely narrow. A physical barrier between the sidewalks and the vehicle lanes is a critical component of this project, until the bridge is either expanded or replaced.

EAST COAST GREENWAY

The East Coast Greenway (ECG) is taking shape as the urban alternative to the Appalachian Trail. The East Coast Greenway Alliance, a national non-profit member organization envisions a 2,600-mile linear route through cities, suburbs, villages, and countryside, from Canada to the Caribbean. The Alliance works through state committees to partner with national, state, and local organizations, agencies, and governments to close gaps and ensure high-quality maintenance. Over 400 miles of related trails are proposed to be established in Virginia.

The State Committee to establish the Greenway in Virginia is headed up by David Brickley, who has worked with the National Park Service to designate 17 miles of the Mount Vernon Trail as Virginia's first segment of the ECG. This trail, which parallels the George Washington Memorial Parkway along the Potomac River, links to Washington D.C. The State Committee is working with the Park Service to extend the trail from Mount Vernon to U.S. Route 1 and then south to Fredericksburg. This Mount Vernon Trail is part of the planned Potomac Heritage National Scenic Trail, which will turn east at the Rappahannock River.

The ECG will enter Fredericksburg across the Chatham Bridge. The City's segment of the trail could follow either the Virginia Central Railway Trail or the Lafayette Boulevard Trail to the south, but coordination will be required with Spotsylvania County. At present, there is no planned route between Fredericksburg and Richmond.

In Richmond, the Greenway divides into two routes. One route follows along or near U.S. Route 1 and is strongly supported by the southside counties. The other route turns southeast, toward Williamsburg (hence the name Virginia Capitol Trail) and then south. This coastal route will follow the Dismal Swamp Canal into North Carolina.

Where feasible, the Greenway Alliance seeks to develop trails that are 12 feet wide. The Chatham Bridge and existing downtown street widths will preclude attaining this standard in Fredericksburg, but these limitations are not unusual in a historic urban setting.

Map 13. East Coast Greenway

IMPLEMENTATION

The preceding pages of this plan offer a vision for developing bicycle and pedestrian trails in the City of Fredericksburg. These facilities will link various destinations, provide recreation and transportation alternatives for a variety of users, and build a safer, healthier, and more livable community. This section of the plan is intended to describe some of the ways in which an adopted plan can be implemented and funded.

KEYS TO SUCCESSFUL IMPLEMENTATION

Coordination and Management – In a study of trails development across the country, all successful trail projects had one common ingredient – an active individual or organization committed to developing a trail system.

Community Support – Successful programs also have active community support. To this end, a volunteer support group, working closely with the City, could play a key role. The City and trails support group would be able to identify user groups and gain their support, emphasize the benefits that a trail system provides, and continue to build community support throughout the building process and beyond.

Realistic Budget – Although the City should be committed to constructing a quality trail system, the budget does not always match the vision. People will use quality trails, while avoiding shoddy ones. Budgets need to cover the actual costs associated with trail development.

Realistic Schedule – Promised completion dates must be kept, or community credibility will be lost. When the City includes a trail project in the CIP, all efforts should be made to ensure that the project is budgeted, and completed in the allotted time. Although this plan provides priorities for construction, the actual construction schedule should remain flexible to take advantage of funding and other opportunities.

Demonstration Project – Community support will evaporate if physical progress is not evident. As a consequence, it may be useful to identify one project to serve as a demonstration project and to build that project as soon as possible. Three projects suitable for demonstration projects are the Rappahannock River Heritage Trail, the Virginia Central Railway Trail and the Downtown Loop.

Building and Maintaining Momentum. It is much easier to keep momentum alive than to rekindle it once lost. Momentum gained during planning should be continued by quickly initiating construction, and once construction begins there should not be a long gap between projects.

PRIORITIES

A number of factors must be taken into account when determining project priorities – immediate needs, potential sources of funding, links to planned transportation projects, cost, and difficulty of implementation. In the previous chapters, individual projects were grouped according to type. Grouping by funding source, however, helps in determining trail priorities. Several trails have significant support from developer proffers. Many of the nature trail systems can be built through volunteer efforts. Some trails are tied to transportation projects and can be funded when designated roads are improved or constructed.

The following recommended priorities do not necessarily indicate that one priority must be completed before another is begun. Because of the different funding possibilities, projects with different priorities can be built at the same time. The following are the priorities of the Fredericksburg Pathways System.

Improve Existing Trails – The Canal Path is scheduled for repair and improvement in 2006. That improvement is limited to resurfacing, but additional funds should be committed for placing signs on the trail and at the street crossings, painting prominent crosswalks at intersections, and adding at least one additional access point. A crosswalk and signs are also needed at the junction of the Mary Washington Boulevard Trail and the Cowan Boulevard Trail.

Construct the Projects Currently in the CIP. These projects include the Rappahannock River Heritage Trail, the Virginia Central Railway Trail, and the Fall Hill Avenue Trail. Although the Fall Hill Avenue trail is tied to a transportation project, the others can be initiated at any time. Since proffered funds exist for the VCR TRAIL, that project should begin as soon as possible.

Build Connections to Trails. As trails are completed, they must connect to other trails or to their destinations. The Rappahannock River Heritage Trail must connect to the Canal Park Trail on both ends, which means establishing crossing facilities at the Fall Hill Avenue bridge and at Princess Anne Street. The Mary Washington Hospital Trail must connect to both the Canal Path and to the Cowan Boulevard Trail. Sometimes these connections only require a simple crosswalk and a few signs, but other connections may require a major intersection redesign or entail an entirely new project, such as the Cowan Boulevard/William Street Connector. Whatever the case, the individual trails have limited worth if they are not connected to one another in a safe and seamless manner.

Improve Intersections and Crossings – In order for the trail system to be effective, ways must be found to safely cross major roads and streams. These crossings can be made using one of the following methods, ranging from least costly to most expensive (stream crossings will invariably be bridges):

- Improve existing crossing facilities such as stream culverts.
- Create obvious crosswalks, with motorist warning signs.

- Redesign and modify traffic signals and intersections to make them pedestrian and bicycle friendly.
- Construct separate crossing facilities such as overhead pedestrian bridges.

Construct Bicycle Lanes and Routes – Although these are a lower priority than other projects, their construction would be on existing pavement and could be accomplished sooner rather than later. There will be issues regarding parking along some streets designated for bicycle lanes, but once those are resolved lanes can be installed fairly quickly.

Construct Nature Trails – These trails are listed last in priority not because they are less important but because their construction is the easiest. Most of the nature trail system can be constructed using volunteer labor under the supervision of City experts at little or not cost to the City. Once the City authorizes a volunteer group to build a trail, that group could provide the plans, equipment, and labor to build the trail. Thus, these trails are really outside the priority system and may be built at any time a volunteer group is ready to undertake a project.

COORDINATION WITH EXISTING PLANS AND FACILITIES

Individual trails must be linked with one another in order to ensure a successful trail system. Connectivity is also a requirement in other ways. Trails must be fully connected to their destinations and also accessible to users. This accessibility means users should be able to get to trails quickly and easily from neighborhoods or from public facilities such as parking lots.

In addition to physical connections, the trail system should be an integrated part of other City plans such as the Comprehensive Plan and the Transportation Plan. A trails system is not an isolated piece of the City's infrastructure, but must be coordinated with the transportation system as a whole.

FUNDING

The costs of designing and constructing a pathways system will be substantial. Potential funding sources are relatively easy to identify, but obtaining funds can be difficult. The following are sources of potential funding for trails.

Public Sector Funding

These sources include the State of Virginia and the Federal Government. There is not one single agency that provides trails funding, since trails may have different aspects that make them of interest to various department sin government – recreation, transportation, environment, historic, and others. Recently adopted policy changes to VDOT call for non-motorized and motorized transportation to receive the same consideration by VDOT, so that facilities for pedestrian and bicycle transportation will be included as part pf all

transportation projects. There are currently a number of funding programs available in the public sector.

Highway Construction Fund – These funds for highway construction or improvement projects that include bicycle facilities. The proposed project must be in the Virginia Transportation Development Plan for VDOT to sue funds for bicycle facilities. Generally, bicycle trails built with these funds will be co-located with new or improved roads.

TEA-21 Transportation Enhancement Program – This federal program is a result of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and is managed and administered by VDOT at the state level. In order to be eligible for funding, a project must meet the following criteria:

- A relationship to the surface transportation system.
- Qualifies under one of the Enhancement Program Categories (paved shoulders, bicycle paths, bike lanes, bicycle racks and lockers, development of education materials, safety campaigns and programs, safety training, and activities related to safety enforcement are all eligible projects).
- Formally endorsed by a local jurisdiction or public agency as evidenced by a resolution and commitment of 20% minimum local match.
- Must be endorsed by a local jurisdiction or public agency as evidenced by a resolution and commitment of 20% minimum local match.
- A duly advertised public hearing must have been held on the project.
- Encourage private sector development patterns that achieve the goals of providing people with better access to jobs, services, and trade centers.

TEA-21 Transit Enhancement Program – Funded through the Department of Rail and Public Transportation, this program provides money for enhancements to transit systems including the accommodation of bicycles, bicycle access, and multimodal connections. Projects typically funded include installation of bicycle storage facilities and the installation of equipment for transporting bicycles on mass transit vehicles.

TEA-21 Scenic Byways Program – Funding is available for a variety of categories, including bicycle and pedestrian facilities, related to scenic byways – roads with special scenic, historic, recreational, cultural, archaeological and/or natural qualities. A local match of 20% is required.

TEA-21 Transportation and Community System Preservation Pilot Program – This program was designed to encourage governments to integrate transportation services with such community needs as community development, environmental protection, preservation of green space, and access to jobs and services.

Congestion Mitigation and Air Quality Improvement Program – This program provides funding through the Congestion Mitigation and Air Quality Improvement

Program for areas in Virginia designated as being in non-attainment for national air quality standards.

Recreational Access Program – Funding is available to provide adequate access to public recreational facilities or historic sites operated by a state agency, a locality, or a local authority. Access includes a bicycle facility. Maximum available funds are \$60,000 with no required match.

State Aid Transit Grants – The Virginia Department of Rail and Public Transportation also administers state aid grant programs. Approximately \$100 million in state grant money is available each year for transit systems including bicycle accommodation. Although no minimum match is required, a local match of 20% is more likely to receive funding than a project with a match of 5%.

Virginia Recreational Trails Fund – The Virginia Department of Conservation and Recreation (DCR) administer the Virginia Recreational Trails Fund. Grant money through this program is available for the purpose of providing and maintaining recreational trails and trail-related facilities. Eligible activities include, but are not limited to the following:

- Development of urban trail linkages near homes and workplaces.
- Maintenance and restoration of existing recreational trails.
- Easement acquisition and development for trail/trail corridors in a state or local trail plan.
- Construction of new trails that meet identified needs on a state, county, municipal, or private lands.
- Construction of new trails on federal lands if certain conditions are met.

Hazard Elimination Safety Program – Part of the federal Highway Safety Improvements Program, HES provides funding to improve areas where there is an abnormally high incidence of crashes. Eligible projects include turn lanes, traffic signals, signs, bicycling hazards, and roadway geometry. Maximum available funds are \$500,000 with a 10% match.

402 Highway Safety Program Annual Grants – Overall, the diversity of eligible programs ranges from drunk driving prevention to motorcycle safety and child safety/safety belt use. Bicycle and pedestrian safety is also an eligible program. Each application must identify a specific use (i.e. bicycle safety) and present a plan to address that issue. Proposals may address efforts to start a new program or they may look at expanding an existing program.

402 Highway Safety Program Mini Grants – Similar to the annual grant program except that monies are available throughout the entire year while funds last. This enables localities and others to react to safety issues that may suddenly arise in their communities.

Private-Sector Funding

Private-sector funding sources may include funds contributed by small businesses, corporations, and grant foundations, civic organizations and citizens. The following entities are potential donors to bicycle and pedestrian facilities:

Corporate Donations – Corporate foundations may be locally based or national, and grant amounts can range from the hundreds well into the millions of dollars. Corporate foundations generally like to see evidence that there is substantial local public and political support for the proposed project. This support most often comes in the form of funds raised from the community and/or appropriated by local government. Most corporate foundations do not fund maintenance activities, but are still very interested in how the project will be maintained once it is built. The Robert Wood Johnson Foundation, for example, is a private, non-profit organization that seeks to improve the health and health care of Americans. It prioritizes grants into four goal areas, one of which is to promote healthy communities and lifestyles.

Civic Organizations – Local civic organizations that will benefit from a bicycle and pedestrian project should be mobilized behind specific projects. These organizations may include bicycle clubs, naturalists, scout troops, bird clubs.

Citizens – There are many ways in which local citizens can become involved with bicycle and pedestrian projects. Working through civic organizations is one way to contribute. Other strategies include creation of a volunteer support organization where individuals and families can become members for a small donation. The club member may receive a small gift such as a tee shirt or water bottle and a newsletter that provides valuable information regarding upcoming events and the implementation status for the project.

Individuals and groups should also be encouraged to work with the City in creating and operating a trails system. Appropriate activities include construction and maintenance of signs, picnic tables, benches, nature trails, etc. A detailed accounting of the work completed and hours worked should be kept in order to estimate the monetary value of the volunteer work. Many grant programs (public and private) allow the value of volunteer efforts to help satisfy a dollar match that is required in the grant. Working closely with City officials, volunteers can provide valuable support that can enhance the City's efforts.

IMPROVING EXISTING CONDITIONS

As the City grows, continuous attention must be directed toward the trail system as a whole. As the trail system expands, for instance, installed signs will need to be reviewed to ensure they still provide adequate direction and/or include updated information. In addition, the needs of trail users must be fully considered during site planning and development and when infrastructure is repaired, modified or constructed.

ADMINISTRATION

The Fredericksburg Pathways Plan sets forth an ambitious vision for a high quality trail system. The design guidelines, implementation strategies, and funding options will help to ensure the quality of each trail on the day it opens. Long term quality is equally important, and once a trail is opened it must be operated and maintained in such a way as to provide a quality facility for many years to come.

OPERATIONS AND MAINTENANCE

The day-to-day management of a trail system includes law enforcement, special events, map and informational brochure updates, and other matters. Specific policies regarding use of the trails will need to be developed in conjunction with trail development and a large part of operations will be the implementation of these policies.

Maintenance includes the actions taken to ensure the trails are kept in a safe and usable condition. These efforts include mowing and brush removal, repairing and replacing signs and benches, repairing trail surfaces, and trail reconstruction. Lifetime maintenance costs should be considered during detailed trail planning.

Roles and Responsibilities - In order for a trails system to be operated and maintained effectively, it must be placed under the responsibility of one agency or organization, even though others may have a significant role. It is recommended that the overall day-to-day operation and maintenance of the Fredericksburg Pathways System be the responsibility of the City Parks, Recreation, and Public Facilities Department, with support provided by other City departments as appropriate.

Some cities have found it helpful to establish an advisory committee as a standing oversight body to coordinate timely construction of the trails system, to promote their use, and to provide a forum for continued citizen and governmental input. If the City desires to form such a committee, its members could include several citizen members, members of the trails support group and other interested groups (such as cyclists), and members from City Council, Parks and Recreation, Planning, Tourism, and the Police departments.

Overall Recommendations

These recommendations should be viewed as guidelines intended to assist in the operation and maintenance of the pathways system.

Establish Operations and Maintenance Policies - Policies should be written as soon as possible after the authorization of the pathways system. A formal document should set forth policies pertaining to the pathways system as a whole and for each individual trail or type of trail. Policies should also address operational rules and maintenance responsibilities. The policy then becomes the adopted directive for ongoing

administration of the trail system. The following items should be part of the operations and maintenance policy:

- Permitted uses on each trail – identification of the activities allowed, which may include cycling, walking, jogging, pets, mountain biking, in-line skating, etc.
- User fees, if any – who will pay, how much, and in what manner.
- Marketing of the trail system – enhancement of economic and health benefits by encouraging trail-related activities.
- Policing and security on the trail system – may include an emergency response plan, trail patrols, and safety measures such as call boxes.
- Issues related to crossings of each trail – may apply to new driveways and streets, whether and new crossings are allowed, the permitting process for new crossings, and issues of responsibility and liability of new crossings.
- Liability – although mostly determined by existing laws, should be fully understood by operating agency.
- Encroachment – definitive policies should exist relating to existing and future encroachments.
- Seasonal maintenance, including snow removal – what seasonal maintenance is needed and who will perform each task.
- Cooperative maintenance agreements – in a partnership between the city and private support groups; policies should spell out who is responsible for specific maintenance.
- Use of volunteers – the role of volunteers in trail operation and maintenance, addressing supervision, accountability, and liability.
- Evaluation of trail conditions – an evaluation schedule for each trail to identify the need for major and minor repairs.
- Short- and long-term maintenance program – a program that provides guidelines for the maintenance requirements of the trail system and each individual trail.

Recommended Maintenance

Maintenance requirements differ according to the type trail, but all trails will require periodic maintenance.

Surfaced Trails - These trails hold up well under most conditions, but are subject to freeze and thaw cycles that cause holes and cracks. The following are guidelines for maintenance of surfaced trails:

<u>Frequency</u>	<u>Maintenance</u>	<u>By</u>
As Needed	<ul style="list-style-type: none"> · Tree & brush clearing, mowing · Sign replacement · Map/signage update · Trash removal · Replacement/repair of trail amenities · Repair of flood damage 	Volunteers, Parks & Recreation

	· Patching & minor regarding	
Seasonal	<ul style="list-style-type: none"> · Snow grooming · Snow plowing · Planting, pruning, beautification · Culvert clean-out · Installation/removal of seasonal signs 	Volunteers, Parks & Recreation
Annual	<ul style="list-style-type: none"> · Surface evaluation · Evaluate support services 	Parks & Recreation
5-Year	<ul style="list-style-type: none"> · Repaint/repair trash receptacles, benches, signs, etc as necessary · Sealcoat asphalt 	Volunteers, Parks & Recreation
10-Year	<ul style="list-style-type: none"> · Resurface/restripe trail 	Public Works
20-Year	<ul style="list-style-type: none"> · Replace or reconstruct trail 	Public Works

Unsurfaced Trails - Less susceptible to freeze/thaw conditions, unsurfaced trails may suffer from runoff in rainy weather, resulting in ruts on the trail. They will need to be designed to minimize erosion, but floods or rains will cause problems that will need attention. Surfaces should be repaired and compacted to maintain a smooth surface. Volunteers could perform most maintenance of unsurfaced trails.

Maintenance Costs

Costs for maintenance vary greatly depending on the type of trail and the conditions. Planners should, however, consider these costs during detailed trail planning to ensure that funding is available to keep trails in usable condition. Maintenance can be broken down into three categories: routine, minor repairs, and major reconstruction.

Routine Maintenance - Most of the routine maintenance for the trail system can be performed by a volunteer group or the Parks and Recreation Department. Routine activities include:

- Annual trail evaluation
- Tree & brush clearing
- Mowing
- Map & signage updates
- Trash removal & cleanup
- Water damage repair, such as culvert cleanout
- Patching
- Snow grooming
- Planting & pruning
- Installation & removal of signs

Annual costs for routine maintenance are estimated as between \$1500 and \$1800 per mile, depending on usage, weather conditions, and other variables.

Minor Repairs. The annual evaluation determines the need for minor repairs. Minor repairs may include:

- Replacement, repair, & repainting of trail support amenities
- Replacement of part of a trail
- Re-striping of trails or bicycle lanes
- Seal-coating of asphalt

Costs for minor repairs may be estimated based on initial construction costs, adjusted for inflation. Seal-coating may cost from \$6,000 to \$7,000 per mile for a 10-foot wide asphalt trail.

Major Reconstruction. Two maintenance actions are considered major reconstruction: resurfacing of asphalt trails and complete trail replacement.

Typically, asphalt trails need resurfacing every 10 years, depending on how well they have been maintained. This resurfacing is usually an overlay of asphalt on the existing surface. A 1-inch overlay may cost from \$13,000 to \$15,000 per mile for a 10-foot wide trail, and a 2-inch overlay could be as much as \$25,000 per mile.

Complete replacement requires removing the existing trail, regrading the trail base, and resurfacing the entire trail. Costs are the same as for initial construction plus demolition of the old trail, adjusted for inflation. Because of the cost involved, trail replacement should be considered well in advance.

EDUCATION AND PUBLIC AWARENESS

A community trails program must provide for educating people about the hazards that may be encountered while using trails, promoting safe conditions, and encouraging more people to walk and ride. The purpose of this section is to highlight the principal issues associated with walking and cycling that have a relationship to education and public awareness. These issues include:

- Safety.
- Acceptance of walking and cycling as legitimate modes of travel.
- Promoting walking as a desirable activity.

To provide a safe environment for pedestrians, planning and engineering professionals, educators, and enforcement officials need to know the characteristics and needs of the pedestrian and cyclist user groups. To interact appropriately and safely with pedestrians and cyclists, motorists need to understand and acknowledge that walking and cycling are accepted and legitimate modes of travel, and that they have a duty to operate their vehicle so as to not endanger pedestrians and cyclists. To be aware of hazards, all pedestrians and

cyclists, young and old, need to understand the danger spots and risks that are associated with an environment that favors the automobile.

Education and awareness efforts are important ingredients in a successful transportation program that not only accommodates pedestrians and cyclists, but also encourages these modes of travel. Frequently, however, a lack of information or, in some instances, misinformation, perpetuates unsafe practices. Additionally, because development patterns of the past 50 years have catered to the automobile, children have become reliant on their parents to drive them to school, dance class, soccer practice, etc. or practice in dealing with various situations.

There are five primary audiences that are the principal targets for education and awareness efforts. These efforts should focus on both pedestrian and bicycle activities.

- Children
- Adults
- Parents
- Motorists
- Transportation Planning and Design Professionals

Safety

Generally, the following actions are recommended to help improve safety for pedestrians:

- Target and eliminate key behaviors that lead to unsafe conditions.
- Encourage schools, safety organizations, and law enforcement agencies to deal with pedestrian and bicycle safety issues and to focus on the most important crash problems.
- Support the development of public awareness campaigns keyed to the most important causes of crashes, injuries, and deaths.
- Encourage the use of safety equipment among pedestrians and cyclists (retro-reflective clothing).
- Educate walkers, bicyclists and motor vehicle users how to safely interact with each other.

Acceptance and Legitimacy

The City can help promote walking as a legitimate mode of travel and recreation by promoting acceptance of the need for all pedestrians to be accommodated by the transportation system. For example, agencies can:

- Develop a means of ensuring public participation in the development and implementation of plans and policies that impact pedestrians and cyclists. Often agencies can create citizen advisory groups to advocate policies, programs and facility improvements that will enhance and promote walking and cycling.

- Develop or revise vision and policy statements to recognize the importance of walking and cycling and the need to integrate these modes into transportation and recreation systems.
- Emphasize pedestrian facility planning, design, and maintenance in all planning.
- Provide training for law enforcement officers in the conduct of safety education and enforcement programs for pedestrians and cyclists.
- Educate planning and enforcement officials — as well as the general public — in the importance of traffic calming as a safety countermeasure.
- Develop and conduct public information and awareness campaigns targeted toward all roadway users, including bicyclists, pedestrians, and motorists, with the intent of modifying behavior and attitudes to provide cooperation among these users.
- Establish a public safety education program using TV, radio, signs, and information materials to teach motorists, bicyclists, and pedestrians how to share the road.
- Develop and conduct public awareness campaigns promoting walking and cycling as means of solving community problems, improving personal health and wellness, and enhancing the quality of life.

Promotion

Usually, as is the case in Fredericksburg, it is enthusiastic citizens who espouse the benefits of walking and cycling and who lobby for improved facilities. The City can support such civic action by establishing an advisory committee. Such a committee could be particularly effective in the area of identifying critical issues and needs that affect pedestrians and cyclists. In addition, the City can initiate the following actions to promote and encourage walking:

- Provide education programs to companies promoting walking or cycling to work.
- Encourage the Chamber of Commerce and other business groups to develop appropriate literature to promote the community as a walkable tourist destination.
- Encourage local organizations to develop walking and cycling tours and maps.
- Encourage and support private sector companies and organizations to become involved in activities designed to facilitate walking and cycling.

SAFE ROUTES TO SCHOOL

Children's lives have altered dramatically over the last few decades. One of the most startling changes is how little independence and mobility they now have compared to the generations who grew up before them. Not so long ago, a vast majority of kids routinely roamed their neighborhoods on foot or bicycle, taking the first steps toward independence. Today, parents chauffeur their kids to nearly all their activities, fearing for their children's safety due to perceived dangers from both crime and traffic. Researchers estimate that while more than two-thirds of all children walked or biked to school as little as thirty years ago, that number has now plummeted to less than ten percent.

A new movement is emerging that is focusing on getting kids back on their feet and back on their bikes. Neighborhood groups, traffic engineers and local officials are working together to make streets safer for pedestrians and bicyclists along school routes, while encouraging both parents and their kids to take advantage of the many benefits of getting around on foot or by bike. With new interest from transportation professionals, public health advocates, neighborhood improvement groups and local elected officials, communities all across the United States are discovering the many benefits of providing *Safe Routes to School*.

In order to encourage more children to walk or bike, parents need to trust that it is both safe and convenient from a variety of perspectives. A concern among some parents is the threat of violence as well as child abduction. While statistics tell us that abductions are an extremely infrequent occurrence, many parents indeed have legitimate concerns about crime, and violence prevention is an important component of *Safe Routes to School* programs in many areas.

The greatest danger for many children walking or biking to school, however, comes from traffic on neighborhood roads and streets. Parents often cite the fear of traffic as one of their top concerns in allowing their kids to walk or bike to school. They note the importance of stronger education programs for both motorists and children, better enforcement of traffic laws, and projects and programs to help slow down the speed of residential traffic. Indeed, it is exactly this type of comprehensive approach to traffic safety problems that has been shown to be most effective in creating safer streets and promoting increased walking and bicycling among Americans of all ages.

Safe Routes to School is an unusual approach to managing transportation. First, it has support from multiple constituencies (transportation, smart growth, public health and safety advocates, parents, teachers, and children), and has manifested itself in a variety of forms. Second, *Safe Routes to School* programs have gained strength from the local and grassroots level, resonating with the desire to recapture the cherished and independent expression of our childhood – the walk/bike to school. And third, where most other transportation strategies focus primarily on marketing and promotion (e.g., campaigns promoting carpooling and/or riding transit), *Safe Routes to School* has an equal or greater emphasis on the provision of infrastructure improvements for walking and biking. Fueling the interest in *Safe Routes to School* is the increasing recognition of the physical disconnect between our schools and homes due to distance and the often frustrating lack of adequate infrastructure.

The City of Fredericksburg supports the *Safe Routes to School* concept and its institution in the City wherever feasible. In concept, *Safe Routes to School* calls for a focus on outcomes more than activities. The goal is to improve the health and well-being of our children by ensuring that most children can and do walk or bike to school most of the time. This vision for our schools can only be realized by:

- Locating schools in close proximity to the children who attend them
- Providing good facilities for walking and biking to school

- Reducing the threats to health and safety posed by motor vehicles, pollution, and crime
- Fostering a cultural shift that accords high value and broad responsibility for the realization of this goal.

Types of Safe Routes Programs

The desire to reduce pedestrian injuries, restore childhood mobility, improve basic health, and reduce automobile traffic near schools has inspired a wide variety of *Safe Routes to School* programs across the United States. Some *Safe Routes to School* projects have existed under other names for decades, and have just recently been recast as *Safe Routes to School*. Others projects are new to this country.

There are many different components involved in the creation of a *Safe Route to School* program, but generally they can be grouped under four broad approaches:

- The Traffic Calming Model
- The Funding Model
- The Encouragement Model
- The Enforcement Model

Many programs mix aspects of these models, and the different models can also co-exist in a single community. This discussion highlights the differences between the models in order to help proponents of Safe Routes think methodically about what they are doing, and why they are doing it. This means distinguishing between ends and means — or goals and methods. For instance, traffic calming is a means to an end — reducing child/vehicle crashes around schools, and encouraging cycling and walking. It is not an end in itself.

The Traffic Calming Model. The Traffic Calming Model is characterized by 1) measurably reducing crashes, injuries and deaths involving child pedestrians or cyclists near schools, and 2) creating congenial and safe walking and /or cycling routes on primary travel corridors to and from schools so as to measurably increase the share of children walking and cycling to school. The method is to use traffic engineering to change motorist behavior, to reduce speeding and reckless driving near schools, and improve the pedestrian environment. Possible features of this model are as follows:

- Use changes in the physical environment near schools — primarily traffic calming engineering — to slow motor vehicle speeds, and reduce the exposure of child pedestrians to turning and backing vehicles.
- Consider community based planning and consensus building process.
- Consider using Walking School Bus, group rides and other public events to increase political and community support for constructing traffic calming and pedestrian improvements.
- Include increased police traffic enforcement.
- Must eventually include active government participation and funding.

- Can be initiated by civic group, advocates, school or government agency.
- Government funding can be as high as \$100,000 minimum capital and planning cost per school.
- Project funding level: High
- Advocacy experience needed: High.
- Most suitable for city level.

The Funding Model - The Funding Model is characterized by the goals of reducing child pedestrian and cycling crashes, and encouraging cycling and walking to schools throughout the city. Methods are to win funding to create engineering, education and enforcement campaigns to change motorist behavior – especially speeding and reckless driving near schools. Funding also supports programs to create congenial street designs, paths and encouragement to motivate children and parents to get kids out of cars and on foot and bike. Features may include

- Legislation guaranteeing significant levels of funding
- Funding, without legislation, from existing safety and transportation funds. (Examples are Federal 402 safety funds and Federal Transportation Enhancement funds.)
- Must eventually include the active support of local elected officials and include effective implementation plans.
- Can be initiated by civic group, advocates, schools or government agency.
- Likely to involve extensive coalition building among a broad list of proponents from health, education, safety, public interest and local government organizations.
- Government funding level: Very High..
- Advocacy funding level to successfully initiate: High.
- Advocacy experience needed: Very High for legislation; Moderate for 402 and other readily identifiable safety funds.
- Suitable for city level.

The Encouragement Model - The purpose of this model is to change child and parent behavior and to encourage walking or cycling to school. Encouragement campaigns are the cheapest, quickest and easiest way for non-government organizations to direct public and political attention to walking and cycling to school. Encouragement typically takes the form of Walking School Buses and group rides. These can be accompanied by marketing and behavioral change methods ranging from coloring books and prizes for kids, to street fairs, meetings and brochures targeting parents. Encouragement campaigns can be developed into a consensus building and marketing tool to win increased community, political and governmental support for traffic calming and increased police enforcement and engineering changes.

Programs using the Encouragement Model typically include these goals and methods:

- Encourage walking and cycling to school.
- Develop safer walking and cycling corridors.
- Walking School Buses, group bicycling, and a variety of encouragement literature targeted at children and their parents.

- Include a public awareness campaign and outreach to press, community and political leaders.
- Can include the active participation of and funding from government agencies.
- Can be initiated and conducted by civic group, advocates, school or government agency.
- Government funding: Not required.
- Advocacy funding level to successfully initiate: Low.
- Advocacy experience needed: Low.
- Suitable for city level.

The Enforcement Model - Numerous police departments across the country have child traffic safety campaigns. Some (like Chicago's) are called Safe Routes to School. Typically the police use crash maps to find schools with the highest number of children struck by cars. Police enforcement is assigned accordingly. Many enforcement campaigns also include police visits to schools where children are educated on safe cycling and walking and given safety literature and prizes. Enforcement campaigns are often a short term response to community anger after children are killed and injured. More effective campaigns are usually part of a broader, sustained traffic enforcement strategy. The Enforcement Model is meant to change motorist behavior through increased traffic enforcement and modify child and parent behavior to improve cycling and walking safety. Ironically, this approach sometimes results in discouraging children from cycling and walking due to the severe nature of police traffic safety information. Features of this model are:

- Reduce child pedestrian and cycling crashes.
- Increased police traffic enforcement; especially during school hours. Tends to be less than one month in duration.
- Educate children and parents in safer cycling and walking practices.
- Can include media campaign with "Get Tough" message to motorists.
- Must include some commitment by police department and the elected body.
- Advocacy funding level to successfully initiate: Low.
- Advocacy experience needed: Medium to low.
- Employs existing police resources.
- Suitable for city level.

APPENDIX 1 – DEFINITIONS

AMERICANS WITH DISABILITIES ACT OF 1990 (ADA) – Federal law prohibiting discrimination against people with disabilities. Requires public entities and public accommodations to provide accessible accommodations for people with disabilities.

AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) – Provides scoping and technical specifications for new construction and alterations undertaken by entities covered by the ADA.

ARTERIAL – Signalized streets that serve primarily through traffic and provide access to abutting properties as a secondary function.

BICYCLE – A vehicle propelled solely by human power upon which any person may ride, having two tandem wheels, except scooters and similar devices. The term “bicycle” for this publication also includes three and four-wheeled human-powered vehicles, but not tricycles for children.

BICYCLE FACILITIES – A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways.

BICYCLE LANE – A portion of a roadway which has been designated by striping, signing and pavement markings for the use of bicyclists.

BIKEWAY – A generic term for any road, street, path or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

BULB-OUT – See Curb Extension.

COLLECTOR – Surface street providing land access and traffic circulation within residential, commercial, and industrial areas.

CROSSING ISLAND – Pedestrian refuge with the right-of-way and traffic lanes of a highway or street.

CROSSWALK – Any portion of a roadway at an intersection or elsewhere that is distinctly indicated for pedestrian crossing by lines or other markings on the surface.
ns opening under a road or a railway. These features are typically used for drainage, but a large enough culvert can also accommodate a trail.

CULVERT – A transverse opening under a road or railway. These features are typically used for drainage, but a large enough culvert can also accommodate a trail.

CURB EXTENSION – A section of sidewalk extending into the roadway at an intersection or midblock crossing that reduces the crossing width for pedestrians and may help reduce traffic speeds.

CURB RAMP – A combined ramp and landing to accomplish a change in level at a curb. This element provides street and sidewalk access to pedestrians using wheelchairs.

DETECTABLE WARNING – Standardized surface feature built in, or applied to, walking surfaces or other elements to warn pedestrians with vision impairments of hazards on a sidewalk and or loading platform, such as the curb line or drop-off.

FEASIBLE – Capable of being accomplished with a reasonable amount of effort, cost, or other hardship. With regard to ADA compliance, feasibility is determined on a case-by-case basis.

GRADE – The slope parallel to the direction of travel that is calculated by dividing the vertical change in elevation by the horizontal distance covered, measured in percent.

GRADE-SEPARATED CROSSING – A facility such as overpass, underpass, skywalk, or tunnel that allows pedestrians and motor vehicles to cross each other at different levels.

GRATE – A framework of latticed or parallel bars that prevents large objects from falling through a drainage inlet but permits water and some sediment to fall through the slots. Wheelchair casters and tires of road bicycles can get caught in poorly placed grate openings.

GUTTER – Trough or dip used for drainage purposes that runs along the edge of the street and curb or curb ramp.

HIGHWAY – A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991 (ISTEA) – Federal legislation authorizing highway, highway safety, transit, and other surface transportation programs from 1991 through 1997. It provided new funding opportunities for sidewalks, shared use paths, and recreational trails. ISTEA was superseded by the Transportation Equity Act for the 21st Century (TEA-21) in 1998, which was superseded, in turn, by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005.

INTERMODALISM – A transportation policy that promotes full development of multiple alternative modes of travel, and encourages the optimization of mode or combination of modes for travel mobility, efficiency, sustainability, economy, and environmental health. The availability, effectiveness, and safety of pedestrian facilities contribute to the achievement of intermodalism.

INTERSECTION – Area where two or more pathways or roadways meet.

LOCAL ROAD – Road that serves individual residences or businesses, and/or distributes traffic within a given urban or rural area.

MEDIAN ISLAND – An island in the center of a road that physically separates the directional flow of traffic and can provide pedestrians with a place of refuge and reduce the crossing distance between safety points.

MIDBLOCK CROSSING – A crossing point positioned within a block rather than at an intersection.

MINIMUM CLEARANCE WIDTH – The narrowest point on a sidewalk or trail, created when obstacles such as utility poles or tree routes protrude into the sidewalk or trail and reduce the design width.

NATURE/HISTORIC SITES TRAIL – A trail for pedestrians only that traverses natural areas and/or guides people to historic attractions.

NEW CONSTRUCTION- Project where an entirely new facility will be build from the ground up.

OBSTACLE – An object that limits the horizontal or vertical passage space, by protruding into the circulation route and reducing the clearance width of a sidewalk or trail.

PASSING SPACE- Section of path or sidewalk wide enough to allow two wheelchair users to pass one another or travel abreast.

PATH OR PATHWAY – Track or route along which pedestrians are intended to travel.

PEDESTRIAN – A person afoot or in a wheelchair.

PEDESTRIAN-FRIENDLY ENVIRONMENT – A setting that is characterized by continuous sidewalks and safe, multimodal connections to local destinations.

RAIL-TRAIL – A shared use path, either paved or unpaved, built within the right-of-way of an existing or former railroad.

RAMP – Sloped transition between two elevation levels.

RIGHT-OF-WAY – A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to transportation purposes.

RIGHT OF WAY – The right of one vehicle or pedestrian to proceed in a lawful manner in preference to another vehicle or pedestrian.

ROADWAY – The portion of the highway, including shoulders, intended for vehicular use.

RURAL – Areas outside the boundaries of urban areas.

SAFE, ACCOUNTABLE, FLEXIBLE, EFFICIENT TRANSPORTATION EQUITY ACT: A LEGACY FOR USERS (SAFETEA-LU) – The federal legislation that authorizes surface transportation programs (including public transportation, highway, safety, and research) through FY2009. It continued the programs initiated through ISTEA and TEA-21.

SHARED ROADWAY – A roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders.

SHARED USE PATH – A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users.

SHOULDER – The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles and for emergency use.

SIDEWALK – The portion of a street or highway right-of-way designed for use by pedestrians.

SIGHT DISTANCE – The length of roadway visible to a driver or pedestrian; the distance a person can see along an unobstructed line of sight.

SIGNED SHARED ROADWAY (SIGNED BIKE ROUTE) – A shared roadway which has been designated by signing as a preferred route for bicycle use.

SUBURBAN – Built up area surrounding a core urban area.

TACTILE WARNING – Change in surface condition providing a tactile cue to alert pedestrians with vision impairments of a potentially hazardous situation.

TRAFFIC CALMING – Traffic calming is the reduction of vehicle speeds through a physical feature along the roadway. These devices are self enforcing because the physical design of the street results in the desired effect.

TRANSPORTATION AGENCY – Federal, state or local government entity responsible for planning and designing transportation systems and facilities for a particular jurisdiction.

TRANSPORTATION EQUITY ACT FOR THE 21st CENTURY (TEA-21) – Federal legislation authorizing highway, highway safety, transit, and other surface transportation

programs from 1998 through 2003. It provided funding opportunities for pedestrian, bicycling, and public transit facilities, and emphasized intermodalism, multimodalism, and community participation in transportation planning initiated by ISTEA.

UNPAVED PATH – Paths not surfaced with asphalt or concrete.

URBAN – Places within boundaries set by state and local officials, having a population of 5,000 or more. Urban areas are often densely populated and contain a high density of built structures.

VERTICLE CLEARANCE – Minimum unobstructed vertical passage space required along a sidewalk or trail. Vertical clearance is often limited by obstacles such as building overhangs, tree branches, signs, and awnings.

VERTICLE CURB- A steep-faced curb, designed with the intention of discouraging vehicles from leaving the roadway.

WIDTH, SIDEWALK – Total width of a sidewalk, including obstructions, which begins at the edge of a roadway and extends to the side of a building. Clear width is the portion of sidewalk that excludes obstructions and any attached curb.

APPENDIX II – PATHWAY DESIGN

APPENDIX III – SIGN STANDARDS

People need travel information whether they are driving, cycling or walking. A variety of sign types give cyclists and pedestrians the information they need while also informing motorists when they are near facilities for non-motorized users and that the presence of cyclists and pedestrians is legitimate there.

In 2003, the Federal Highway Administration adopted the Manual on Uniform Traffic Control Devices (MUTCD). This document provides specifications on the design and placement of traffic control signs, including cycling and pedestrian related signs, placed in the public right-of-way. The MUTCD encourages a judicious use of signs, though. Overuse of signs diminishes their effectiveness so they should be installed only to fulfill a carefully considered need. In addition, signs and signposts can become a source of visual blight as well as act as obstructions to the users they are meant to serve.

Regulatory Signs – Regulatory signs inform users of a legal requirement, such as STOP or YIELD. They should only be used when the legal requirement is not otherwise apparent. Pedestrians may be diverted from unsafe crossings by USE CROSSWALK signs, although care must be taken to avoid excessive diversions.

Warning Signs – Warning signs inform users of unusual or unexpected conditions.

Pedestrian Crossing Signs – Pedestrian crossing signs warn motorists that there is a potential pedestrian conflict area in front of them. In addition, signs at the crossing itself pinpoint where that conflict occurs.

School Warning Signs – School warning signs warn motorists about school bus stops and school zones.

Wayfinding Signs – Most wayfinding signs are installed to direct motorists. They are usually large and mounted high, to be visible relatively far away from a moving vehicle. There are no specific standards for pedestrian wayfinding signs, but they need not be as large as vehicle oriented signs. In addition, distances can be provided in blocks, average walking/biking time, or some other measure that has meaning to pedestrians or cyclists.

Street Name Signs and Traffic Signals – Most street name signs and traffic signals will serve pedestrians, but there are some instances when this is not the case. Signs typically face only the oncoming traffic on one way streets. Since pedestrians will approach signs from both directions, signs should always face both ways. Similarly, signs and signals on mast arms over a roadway may not be visible to pedestrians. Supplemental signs and signals should be used on the street corners.

Pedestrian Signals in a Coordinated Signal System – Coordinated traffic signals are timed in a sequence to enhance the flow of vehicular traffic. Pedestrian signals in such a system, however, can degrade its efficiency. Pedestrian safety does not need to be

compromised in the interest of vehicle movement, but integration will require a careful attention to pedestrian volumes and coordination with appropriate pedestrian signal equipment.

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AMENDMENTS